POLICE STRESS:
THE PSYCHOLOGICAL AND PSYCHOPHYSIOLOGICAL RESPONSES OF POLICE OFFICERS TO OCCUPATIONAL STRESSORS

by

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Submitted in fulfilment of the requirements for the degree of
Doctor of Philosophy

University of Tasmania / Dept of Psychology
March 1997

I certify that this thesis contains no material which has been accepted for the award of any other higher degree or graduate diploma in any university, and that to the best of my knowledge and belief the thesis contains no copy or paraphrase of material previously published or written by another person, except where due reference is made in the text of the thesis.

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ABSTRACT

The occupation of law enforcement has been heavily researched. This research has focused on the antecedents and consequences of police stress. Several limitations were noted in the existing body of research, particularly the reliance primarily on self-report data, and the tendency not to include comparison groups.

This investigation examined aspects of police stress, incorporating psychophysiological and psychological measures of stress. Further, comparison groups were included to index the relative stressfulness of police work and the ways in which police officers responded to aspects of their work. Three studies were conducted.

Study One examined the issue of police work being highly stressful, taking into account limitations noted in the general occupational stress literature. In this study, male police officers and clerical workers monitored their heart rate, blood pressure and self-reported levels of stress and arousal over a two week period. Measurements on work days, during which stressful events occurred, were compared to nonevent work days and nonwork days. Support was evident for the distinction between work and nonwork days, and support was demonstrated for differences between different types of work days. The research indicated that police work was not more stressful than clerical work, but the nature of the stressors experienced were different for the two occupations.

The results of this study indicated the importance of stressful situations in the responses of police officers, particularly attending the scene of a serious car accident, delivering a death notification, and appearing as a witness in court. These work situations were further investigated in the second and third studies. The work situations were investigated within the transactional model of stress.

In Study Two, the police officers' cognitive and behavioural responses to the work situations were investigated. The officers were interviewed at length

about their experience of each of the target situations. They completed a number of scales measuring cognitive appraisal and coping. Results demonstrated that police officers appraised these situations as challenging and as having to be accepted. Results also demonstrated that the police officers employed problem-focused, emotion-focused and dysfunctional coping strategies during a stressful situation, but relied on emotion-focused coping strategies after a situation had ended.

Study Three tested the psychophysiological responses of police officers to the work situations, and the relationship between these responses and cognitive appraisal and coping. Personalised guided imagery was employed to expose the police officers to previous experiences of the target situations. Additionally, two control situations, a period of nonstressful exercise and a neutral situation, were included in the design. A control group of undergraduate students was employed to compare the officers' psychophysiological responses to the control situations and one stressful situation. Guided imagery scripts were constructed using a four stage methodology. The four stages incorporated setting the scene, the events leading up to the situation, a description of the behaviours and responses to the situation, and the moments following the situation. Imagery scripts were presented, in a counterbalanced order, during a single laboratory session. Participants completed visual analogue scales following each script presentation. Results demonstrated several differences in psychophysiological and subjective responses to the common stressful situation, but not to the two control situations. Analyses of the police data indicated that psychophysiological arousal and subjective responses were higher for the three work situations compared to the control situations. Differential patterns of responding were demonstrated for the three work scripts. The results clearly demonstrated that the various aspects of stressful encounters were related to the subjective and, to a lesser extent, the psychophysiological responses of police officers to those encounters.

The research conducted indicated that police work was no more stressful than clerical work, and that police officers' responded psychophysiologically and subjectively to various situations in ways similar to people not engaged in police work. However, it was evident that particular aspects of police work placed greater demands on the coping abilities of police officers. The results have clear implications for the management of stress in police officers.

Acknowledgements

I extend my thanks and appreciation to several groups of people who have supported me during my doctoral studies. Special thanks go to the members of the Tasmanian police force who contributed to this research. The role of police officers Craig Waterhouse, Reg Brown and David Grimsy in assisting with recruiting participants was very much appreciated. The enthusiasm shown by personnel at Glenorchy Police Station exceeded my expectations, and made the task at hand an enjoyable experience. I am particularly grateful to the police officers who so willingly shared their work experiences with me.

Thanks also go to staff and friends at the University of Tasmania. The supervision provided by Dr Janet Haines and Dr Chris Williams was appreciated. The friendships I shared with Janet, Kerryn Brain, Rob Hecker, Karen Chilcott, Carolyn Driscoll, Pat Westhead and Sue Ross made my time in Tasmania an enjoyable experience.

My move to the University of Ballarat has been rewarding, in part because of the support I received from staff in psychology. In particular, I wish to thank Dr Angus McLachlan, Rajes Shenton, Helen Fawkner, Maureen O'Sullivan, Margot Murphy, Lisa Hopes, Dr Lesley DeMello and Alan Penhall.

On a personal note, I wish to thank my parents, David and Patricia McLaren, for the support they have given me during 23 years of continuous education. Yes, Dad, I have finally left school!!! Special thanks to my beautiful girls, Tas, Cassie and Jessie (dec), for reminding me that life existed outside university walls.

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CHAPTER ONE

INTRODUCTION TO THE INVESTIGATION

1. INTRODUCTION TO THE INVESTIGATION

1.1 The nature of stress

The occupation of law enforcement has been seen to have wide ranging detrimental effects on police officers (e.g., Carlier, Lamberts, Fouwels & Gersons, 1996; Duckworth, 1991; Follette, Polusny & Milbeck, 1994; Norris, Carroll & Cochrane, 1990; Sigler & Wilson, 1988; Stearns & Moore, 1990, 1993; Tang & Lau, 1996). Given the important role police officers have played in society, it has been necessary to investigate ways in which such negative effects could be minimised. Investigating the stress involved with being a police officer has been seen to assist in this process.

The term "stress" was first used in English during the seventeenth century to describe distress, adversity, hardship and oppression (Spielberger, 1979). By the end of the nineteenth century, the meaning of stress had shifted to denote a force, pressure or strong influence acting upon a physical object or person.

Few would argue that since the adoption of the term stress, research has proliferated. Indeed, renowned researchers such as Lazarus and Folkman (1984) and Selye (1982) have acknowledged this proliferation. It has been assisted by researchers using the term stress in place of other concepts such as anxiety, emotional disturbance and trauma (Cofer & Appley, 1964).

The magnitude of research published about stress has made it difficult to present an overall definition. It has been argued that the concept of stress was vague and ambiguous (Dobson, 1982). After surveying relevant literature, Dobson reported that there were over three hundred definitions of stress. Models of stress have been proposed in order to give an understanding to the vast array of definitions documented (Cox & MacKay, 1981; Dobson, 1982). Three main models of stress have been proposed: response-based, stimulus-based and

cognitive models. Briefly, response-based models of stress treated stress as a dependent variable, that is, as a response or response pattern (Cox & MacKay, 1981). Typical of such an approach was Hans Selye's (1950, 1956) General Adaptation Syndrome. The stimulus-based models viewed stress as an independent variable, and regarded stress as a property of the external environment (Cox & MacKay, 1981). Cognitive models of stress emphasised the relationship between the individual and the environment (Cox & MacKay, 1981). It was the individual's perceptions of demand and ability to respond to environmental demands that were important in this approach.

The work of Lazarus and colleagues (e.g., Folkman & Lazarus, 1980, 1985; Lazarus, 1966; Lazarus & Folkman, 1984) has been based on this approach, with the tenet that cognitive appraisal, an individual's interpretation of a stimulus, was central to the stress process. These three models of stress have been represented in the vast array of research conducted on stress. It has been postulated that the model of stress adopted depends on the research question being investigated (Brown & Campbell, 1994; Dewe, 1991b).

It has been contended that the stress process was a complex, whole body response, which incorporated psychophysiological, cognitive, emotional and behavioural changes (Fleming & Baum, 1987; Steptoe, 1991). For example, researchers have monitored psychophysiological changes through measures such as blood pressure (BP) (Chinhong & McGarvey, 1996; Edwards, 1995; Sims, 1995), heart rate (HR) (Myrtek, Weber, Brugner & Muller, 1996; Payne & Rick, 1986), and the secretion of catecholamines and corticosteroids (Bohlin, Eliasson, Hjemdahl, Klein & Frankenhaeuser, 1986; Korunka, Huemer, Litschauer, Karetta & Kafkalutzow, 1996). Cognitive responses have been demonstrated through lowered levels of concentration at work (Rusinova, 1990), changes in motivation (Spera, Buhrfeind & Pennebaker, 1994; Yiu-Kee & Tang, 1995) and in performance (Abramis, 1994; Pithers & Fogarty, 1995; Strutton & Lumpkin,

1994). Psychological reactions to stress have been shown to include emotional states such as anxiety (Bohnen, Nicolson, Sulon & Jolles, 1991; King, Taylor, Albright & Haskell, 1990), depression (Kinnunen, Parkatti & Rasku, 1994; McKnight & Glass, 1995; Murphy, Beaton, Cain & Pike, 1994) and irritability (Bohlin et al., 1986). Thus, consequences of stress, whether viewing them as a direct response or the results of a stimulus cognitively appraised as stressful, have been considered multidimensional. It has been argued, therefore, that researchers of stress needed to utilise measures which assessed the different responses.

1.2 Occupational stress

One area of stress that has received attention, particularly in recent times, has been occupational stress. Reasons for the interest in occupational stress have included the cost of work-related stress to the individual, the work organisation and society as a whole. For example, occupational stress has been linked to cardiovascular disease in individuals (Johnson, Hall & Theorell, 1989; Melamed, Kushnir & Shirom, 1992; Uehata, 1991) and to decreased job satisfaction (Guppy & Rick, 1996; Jain, Lall, McLaughlin & Johnson, 1996; Jansen, Kerkstra, Abusaad & Vanderzee, 1996; Leong, Furnham & Cooper, 1996; Locker, 1996). Further, it has impacted negatively on the family (Adams, King & King, 1996; Doby & Caplan, 1995; Kinnunen, Gerris & Vermulst, 1996; Leiter & Durup, 1996; Rout, 1996; Rout, Cooper & Rout, 1996).

Organisations have been disrupted as a consequence of occupational stress. For example, some researchers reported a relationship between stress and absenteeism (Cooper & Bramwell, 1992; Donaldson, 1993; Geurts, Buunk & Schaufeli, 1994; Harvey & Burns, 1994; Heaney & Clemans, 1995; Kohler & Mathieu, 1993; Kompier & Di Martino, 1995; Parker & Kulik, 1995; Ramanathan, 1992; Saxton, Phillips & Blakeney, 1991). Employees suffering stress have been

reported to have had more accidents at work (Cartwright, Cooper & Barron, 1996; Lowenstein, 1991; Rundmo, 1995; Sutherland, 1993) and were more likely to terminate their employment than other employees (Blix, Cruise, Mitchell & Blix, 1994; Hochwater, Perrewe & Kent, 1993; Hromco, Lyons & Nikkel, 1995; Huebner, 1992; Parker & Kulik, 1995; Rahim & Psenicka, 1996; Sager, 1994; Saxton et al., 1991). They also tended to be less productive than other employees (Caldwell & Ihrke, 1994; Hatfield, 1990; Kompier & Di Martino, 1995). Work-related stress has led to early retirement, which resulted in marked financial burden to the organisation (White, Olson & Knowles, 1981).

A more recent phenomenon also has encouraged empirical research into occupational stress. There has been an increase in the number of employees suing their employers for negligence in the work place (Bale, 1990; Hollis & Goodson, 1989) and in the number of workers' compensation claims being lodged (Earnshaw & Cooper, 1991; Haines, Williams & Woo, 1996a). For example, the California Workers' Compensation Institute reported a 700% increase in mental stress claims between 1979 and 1988 (Earnshaw & Cooper, 1991). A substantial rise in workers' compensation claims for stress has been noted in Tasmania (Haines et al., 1996a). Thus, employers are being made legally responsible for the physical and psychological well being of their employees (Howard, 1995). The financial cost, regardless of moral obligation, appears to have played a role in the advancement of occupational stress research.

In the proliferation of research that has emerged, most studies have focused on specific occupations. Much of the research conducted has investigated the antecedents and consequences of the stress involved with working in a particular occupation. For example, studies have been conducted with regard to air-traffic controllers (Repetti, 1993; Theorell et al., 1990), teachers (Davis, 1990; DeFrank & Stroup, 1989; Gadzella, Ginther, Tomcala & Bryant, 1991; Kinnunen, 1988; Wolpin, Burke & Greenglass, 1990), bus drivers (Duffy & McGoldrick, 1990;

Evans, 1994; Evans & Carrere, 1991; Evans, Palsane & Carrere, 1987; Pokorny, Blom & Opmeer, 1988), prison officers (Dignam & West, 1988; Dollard & Winefield, 1995; Härenstam, Palm & Theorell, 1988; Härenstam, Theorell, Orth-Gomer, Palm & Unden, 1987; Morrison, Dunne, Fitzgerald & Cloghan, 1992; Rutter & Fielding, 1988; Smith, 1988), dentists (Cooper, Mallinger & Kahn, 1978), surgeons and anaesthetists (Payne & Rick, 1986), physicians (Olkinuora et al., 1990), nurses (Bacharach, Bamberger & Conley, 1991; Jamal, 1990; Motowildo, Packard & Manning, 1986), clerical workers (Stearns & Moore, 1990; Steffy & Jones, 1988), academics (Richard & Krieshok, 1989), firefighters (Douglas, Blanks, Crowther & Scott, 1988; Roy & Steptoe, 1994), paramedics (Goldstein, Jamner & Shapiro, 1992), social workers (Jayarante, Himle & Chess, 1988), human service professionals (Cherniss, 1992; Lee & Ashforth, 1993; Shinn, Rosario, Mørch & Chestnut, 1984), business managers (Geare, 1990), engineers (Bacharach et al., 1991) and police officers (Brown, Cooper & Kirkcaldy, 1996; Carlier et al., 1996; Crank, Regoli, Hewitt & Culbertson, 1995; Storch & Panzarella, 1996).

1.3 Outline of the problem

Research has indicated that police officers experienced stress in response to their occupation (e.g., Duckworth, 1991; Farkas, 1986; Follette et al., 1994; Hills & Norvell, 1991; Kuch, Travis & Collins, 1995; Sigler & Wilson, 1988; Smith & de Chesnay, 1994; Stearns & Moore, 1990, 1993; Tang & Lau, 1996). A debate about the relative stressfulness of police work has been evident in the literature. Law enforcement has been postulated by some to be a high stress occupation (e.g., Alkus & Padesky, 1983; Beutler, Nussbaum & Meredith, 1988; Ely & Mostardi, 1986; Fell, Richard & Wallace, 1980; Kroes, Margolis & Hurrell, 1974; Martin, McKean & Veltkamp, 1986; Pelletier, 1984; Sigler & Wilson, 1988; Stradling,

Crowe & Tuohy, 1993; Territo & Vetter, 1981; White et al., 1981). However, others have claimed that police work was no more stressful than other occupations (Gaines & Jermier, 1983; Hart, Wearing & Headey, 1995; Lester & Gallagher, 1980; Lester & Mink, 1979; Marmar, Weiss, Metzler, Ronfeldt & Foreman, 1996; Pendergrass & Ostrove, 1984). This debate has not been resolved because many researchers did not include comparison groups in their research, and those who employed comparison groups usually did not give a rationale for the particular groups selected.

The antecedents and consequences of stress and, more recently, the ways in which police officers coped with this stress have been researched. Results indicated that police officers were stressed by the organisation in which they worked (e.g., Brandt, 1993; Brown & Campbell, 1990; Crank & Caldero, 1991; Evans & Coman, 1993; Kroes et al., 1974; Lawrence, 1984; Storch & Panzarella, 1996), and by operational tasks they performed (e.g., Bartol, Bergen, Volckens & Knoras, 1992; Brown & Campbell, 1990; Crank & Caldero, 1991; Evans & Coman, 1993; Kroes et al., 1974; Larsson, Kempe & Starrin, 1988; Sewell, 1983; Storch & Panzarella, 1996). The literature provided little detail as to why particular operational tasks have been stressful for police officers. Research demonstrated that police officers mainly utilised coping strategies directed at dealing with the problem causing the stress (problem-focused coping) (Evans, Coman, Stanley & Burrows, 1993; Hart et al., 1995; Kirkcaldy, Cooper, Eysenck & Brown, 1994), although social support, directed at dealing with the emotions aroused by the stress (emotion-focused coping), also was used (Alexander & Walker, 1994; Kirkcaldy, Cooper, Eysenck & Brown, 1994). One aspect of the stress process, cognitive appraisal, has been proposed as central to stress according to the transactional model of stress (Folkman, Lazarus, Dunkel-Schetter, DeLongis & Gruen, 1986; Folkman, Lazarus, Gruen & DeLongis, 1986; Lazarus & Folkman, 1984). However, researchers of stress in police officers have rarely investigated this

aspect of the stress process, a limitation also noted in the general occupational stress literature (Dewe, 1991b, 1992).

A further limitation of police stress research has been based on methodological shortcomings. Researchers have focused almost exclusively on self-report data. Whereas a distinct move was evident in the general occupational stress literature to utilise psychophysiological measures as well as self-report measures (e.g., Davis & Rodela, 1990; Evans & Carrere, 1991; Fox & Dwyer, 1995; Korunka et al., 1996; Kozena, Harvath, Frantik & Nosek, 1995; Shapiro, Jamner & Goldstein, 1993; Siegrist, 1995; Sims, 1995; Travers & Cooper, 1994), inspection of the literature indicated that just 11% of police stress researchers had incorporated psychophysiological measures in their research. It was evident that even when researchers had incorporated psychophysiological measures into their research, basic methodological issues had not been addressed.

To summarise, it was evident that future research investigating police stress should include comparison groups so that the relative stressfulness of police work could be measured. Further, subjective and psychophysiological dependent variables need to be included to more fully clarify the stress process. The interpretation (cognitive appraisal) of specific work situations and the ways in which police officers coped with such situations also need to be investigated.

1.4 Overview of research

The purpose of this research was to investigate the ways in which police officers reacted to and coped with stressful aspects of their occupation. The first study investigated the stressful nature of police work, including the relative stressfulness of this occupation compared to clerical work. Further, it addressed limitations detected in the general occupational stress literature. Two such limitations were the tendency of researchers to use short time frames for research,

and for workers to be instructed to rest on days away from work instead of engaging in their usual activities. In this study, male police officers and male clerical workers monitored their HR, BP and self-reported levels of stress and arousal over a 2 week period. Measurements on work days, during which stressful events occurred, were compared to nonevent work days and nonwork days. Two group differences were demonstrated, with the clerical workers reporting higher levels of stress, and the police officers reporting higher levels of arousal. Support was evident for the distinction between work and nonwork days, and support was demonstrated for differences between different types of work days. The research indicated that police work was not more stressful than clerical work, but the nature of the stressors experienced was different for the two occupations.

The results of this study emphasised the importance of stressful events in the responses of police officers. Three particular stressful events were demonstrated to be important: attending the scene of a serious car accident; delivering a death notification; and appearing as a witness in court. These work situations were further investigated in the second and third studies. When investigating the impact of specific situations on individuals, it was clear from the transactional model of stress that cognitive appraisal and coping were crucial. The transactional model of stress was described in detail, and literature on cognitive appraisal and coping in the context of occupational stress was reviewed. It was evident that those investigating police stress had rarely included cognitive appraisal in their research. This limitation also was noted in the general occupational stress area.

In light of this extensive review and the results of the first study, police officers were interviewed at length about one experience of each of the target situations. They completed a number of scales measuring cognitive appraisal of the situations and the way in which they coped during and after the situations. Results demonstrated that police officers appraised these situations as challenging and as having to be accepted. These results were similar to a study conducted in Sweden

(Larsson et al., 1988). Results also demonstrated that police officers employed problem-focused, emotion-focused and dysfunctional coping strategies during a stressful situation, but relied on emotion-focused coping strategies when a situation had ended.

Whereas the second study highlighted how police officers responded psychologically to work situations, it was necessary to determine how they responded psychophysiologically to these operational tasks. A review of the literature demonstrated difficulties had been experienced measuring psychophysiological responses to specific work situations. Based on research examining clinical disorders that also were difficult to investigate (Brain, Williams & Haines, 1996; Driscoll, Williams & Haines, 1996; Haines, Williams, Brain & Wilson, 1995; Williams, Haines & Brain, 1995; Williams, Wilson, Montgomery & Batik, 1989), it was proposed that guided imagery would facilitate the investigation of police officers' responses to the target situations.

The third study investigated the psychophysiological and subjective responses of police officers to specific work situations. Further, the psychophysiological and subjective correlates of cognitive appraisal and specific coping strategies were investigated. Tasmanian police officers were interviewed about attending a serious car accident, delivering a death notification, and attending court. Two control situations, a period of nonstressful exercise and a neutral situation, were included in the design. A control group of undergraduate students was used to compare the officers' psychophysiological responses to the control situations and one stressful situation. Guided imagery scripts were constructed using a four stage methodology. The four stages incorporated setting the scene, the events leading up to the situation, a description of the behaviours and responses to the situation, and the moments following the situation. Imagery scripts were presented, in a counterbalanced order, during a single laboratory session. Participants completed visual analogue scales following each script presentation.

Results demonstrated several differences in psychophysiological and subjective responses to the common stressful situation, but not to the control situations. Analyses of the police data indicated that psychophysiological arousal and subjective responses were higher for the three work situations compared to the control situations. Differential patterns of responding were demonstrated for the three work scripts. Results also indicated that cognitive appraisal and the coping strategies utilised were related to the psychophysiological and psychological responses of police officers to the work situations.

The research conducted suggested that police work was no more stressful than clerical work, and that police officers responded psychophysiologically and subjectively to various situations in ways similar to individuals not engaged in police work. However, it was evident that operational aspects of police work placed particular demands on the coping abilities of police officers. There was little doubt that specific work situations evoked strong responses in police officers and that these responses, in part, were dependent on the specific situation. The results of the third study have clear implications for the management of stress in police officers. The role of cognitive appraisal in occupational stress has been highlighted by the current research. The implications were discussed. It was suggested that the relationship between cognitive appraisal and psychophysiological responses of individuals to stressful encounters be the focus of further research.

CHAPTER TWO

THE MEASUREMENT OF STRESS

2. THE MEASUREMENT OF STRESS

2.1 Stress measurement

The stress process has been described as a complex, whole body response, which involved psychophysiological, cognitive, emotional and behavioural changes (Fleming & Baum, 1987; Steptoe, 1991). To monitor all of these changes comprehensively, it has been regarded as necessary to include psychological, behavioural, psychophysiological and biochemical indices in the investigation of stress reactions (Fleming & Baum, 1987; Steptoe, 1991). However, it has been noted that researchers have relied heavily on the use of self-report data (Bruning & Frew, 1987; Burke, 1987c; Fried, Rowland & Ferris, 1984) to the exclusion of other types of measures. To more fully clarify the process of stress, it has been proposed that researchers employ both psychological and psychophysiological measures in their research (Balick & Herd, 1987; Burke, 1987c; Fleming & Baum, 1987; Ganster, Mayes, Sime & Tharp, 1982; O'Keeffe & Baum, 1990). Balick and Herd (1987, p. 104) contended that the search for psychophysiological indicators of job stress was necessary because "individual perceptions of stress and stressful situations are not well defined and are not consistent between individuals". In addition, it has been demonstrated that individuals do not immediately recognise alterations in psychophysiological arousal and will rate their psychological response (anxiety/fear/calmness) as being different to that suggested by their psychophysiological arousal in situations that were emotionally charged (Brain, Haines & Williams, 1997; Haines et al., 1995).

It has been contended that psychophysiological markers provided objective evidence of stress and its impact on individuals (Steptoe, 1991). This was opposed to self-report measures of stress, which have been understood to be easily influenced by unintentional subject bias and intentional manipulation (Lester, Nebel

& Baum, 1994). The heavy reliance on self-report measures in stress research has led to difficulties involving measurement contamination, the results of which were spurious correlations between variables under investigation (Fried et al., 1984; Steptoe, 1991). Despite these methodological difficulties, self-report measures of stress have provided information not easily assessed through other means, and should be used in conjunction with other indices of stress in order to complete the measurement of the stress process (Lester et al., 1994). Therefore, it appears that the investigation of stress should include both psychological and psychophysiological indices of stress.

2.2 Psychophysiological measures of stress

Psychophysiological measures of stress have assessed arousal of the sympathetic branch of the autonomic nervous system through its effects on specific organs or systems (Fleming & Baum, 1987). Psychophysiological arousal has been reflected in the cardiovascular and respiratory systems and in increased electromyography (EMG) and electrodermal responses, as evidenced by elevated HR, BP, respiration, muscle tension and perspiration (Fleming & Baum, 1987; Lester et al., 1994; Stern, Ray & Davis, 1980). In occupational stress research, investigators have utilised oral temperature (Pokorny et al., 1988), BP (Bohlin et al., 1986; Frankenhaeuser et al., 1989; Goldstein et al., 1992; Hutt & Weidner, 1993; Lundberg, Granqvist, Hansson, Magnusson & Wallin, 1989; Pincomb, Lovallo, Passey, Brackett & Wilson, 1987; Sausen, Lovallo, Pincomb & Wilson, 1992; Siegrist & Klein, 1990), HR (Douglas et al., 1988; Frankenhaeuser et al., 1989; Goldstein et al., 1992; Kuorinka & Korhonen, 1981; Lundberg et al., 1989; Payne & Rick, 1986; Pincomb et al., 1987; Sausen et al., 1992; Siegrist & Klein, 1990; Smith, 1988), and EMG (Gomer, Silverstein, Berg & Lassiter, 1987) to

assess the demands placed on the individual by engaging in work-related behaviours or spending time in a work-related environment.

The role of the endocrine system in the stress process also has been studied (Fleming & Baum, 1987; Frankenhaeuser, 1986). The secretion of catecholamines and corticosteroids have been demonstrated to be effective markers of stress and have been useful in determining the impact of work situations on employees from a variety of occupations, the stress involved in specific situations, including public speaking, and the impact of mental stress on individuals (Bohlin et al., 1986; Bolm-Audorff, Schwämmle, Ehlenz & Kaffarnik, 1989; Frankenhaeuser, 1986; Frankenhaeuser et al., 1989; Houtman & Bakker, 1991a, 1991b; Lundberg et al., 1989; Steffy & Jones, 1988). However, the cost of using such methods of assessment have been high, as well as labour-intensive (Fleming & Baum, 1987). It appeared that the easiest and most cost-effective methods, namely the measurement of HR and BP, also were the most commonly employed methods in occupational stress research (Fleming & Baum, 1987).

2.2.1 Cardiovascular measures of stress

Measures of cardiovascular reactivity such as HR and BP have been employed by many investigators of stress (eg., Bohlin et al., 1986; Douglas et al., 1988; Frankenhaeuser et al., 1989; Goldstein et al., 1992; Hutt & Weidner, 1993; Kuorinka & Korhonen, 1981; Lundberg et al., 1989; Payne & Rick, 1986; Pincomb et al., 1987; Sausen et al., 1992; Schnall et al., 1990; Siegrist & Klein, 1990; Smith, 1988; Steptoe, Roy & Evans, 1996). Some of this research has demonstrated general arousal associated with working (Frankenhaeuser et al., 1989; Gellman et al., 1990; Harshfield, Pickering, Blank & Laragh, 1986; Lundberg et al., 1989; Steptoe et al., 1996), whereas other research has indicated increased cardiovascular reactivity in response to specific work events or specific

aspects of the work environment (Bohlin et al., 1986; Dolan, Sherwood & Light, 1992; Douglas et al., 1988; Frew & Bruning, 1987; Goldstein et al., 1992; Sausen et al., 1992; Schnall et al., 1990; Smith, 1988).

Under high arousal, the activated sympathetic nervous system, coupled with the release of catecholamines from the adrenal medulla, increased cardiovascular activity in order to direct blood to the organs (heart and skeletal muscles) that would enable the person to quickly respond (Fleming & Baum, 1987; Steptoe, 1991). HR, systolic blood pressure (SBP) and diastolic blood pressure (DBP) generally increased in response to stress, although the changes occurred independently (Fleming & Baum, 1987). These measures were able to provide cost efficient, rapid and sensitive assessment of responses to psychological and physical stressors (Balick & Herd, 1987). The equipment needed to measure HR and BP can be lightweight, easy to use and practical for field research (Fleming & Baum, 1987).

Just as self-report measures of stress have disadvantages, so too must researchers be vigilant when using psychophysiological measures. It has been contended that the procedures typically used for measuring the psychophysiological symptoms of stress were often inadequate (Fried et al., 1984). Specifically, for cardiovascular measures, it has been proposed that researchers must be aware of, and control for, familial tendency for hypertension, health disorders, sex, race, age, posture, consumption of caffeine, nicotine and alcohol before or during measurements, exercise before or during measurement, and time of day because all of these factors affected HR and BP (Fried et al., 1984). For example, interactions between age and HR (Arena, Blanchard, Andrasik & Myers, 1983; Sharpley & Scuderi, 1994) have been demonstrated. Research has indicated that young adults evidenced significantly greater increases in HR than children (Sharpley, 1992). Comparisons of different age groups of adults showed that HR reactivity of young adults (< 25 years) was greater than HR reactivity of older adults (> 25 years)

(Sharpley & Scuderi, 1994). Baseline SBP and DBP have been demonstrated to increase with age, as has SBP reactivity to stressful tasks (Steptoe, Moses & Edwards, 1990). Increased cardiovascular activity also has been demonstrated in elderly people when compared to those under 25 years of age (Harrison & Kelly, 1989). This research indicated that HR reactivity was greater for younger adults than for other participants in the research, but that BP generally increased with age.

Sex differences have been shown for HR and BP (Allen, Stoney, Owens & Matthews, 1993; Sharpley, 1994). For example, a recent study demonstrated that women had consistently higher HR under stress, whereas men had higher BP under stress (Sharpley, 1994). Similar results were evidenced in another study, with the authors concluding that men were more likely to be "vascular" reactors, and women were more likely to be "cardiac" reactors (Allen et al., 1993).

Familial influences on HR and BP have been established (Adler, Ditto, France & France, 1994; Ditto, 1993; Fredrikson, Tuomisto & Bergman-Losman, 1991; Miller & Ditto, 1991). Research has identified genetic effects on resting HR and BP, as well as on reactivity during periods of stress (Ditto, 1993). Children of parents with a history of hypertension have been shown to have excessive psychophysiological responses, including cardiovascular responses, during behavioural stressors (Fredrikson et al., 1991). Other research has demonstrated that children of hypertensives exhibit significantly greater BP levels in anticipation of donating blood than children of normotensives (Adler et al., 1994). The sympathetic nervous system has been implicated in the exaggerated cardiovascular responses of children whose parents were hypertensive (Miller & Ditto, 1991).

As noted, race has been identified as a variable that influenced cardiovascular responses (Anderson, Lane, Taguchi & Williams, 1989; Goldstein & Shapiro, 1995; Light, Turner, Hinderliter & Sherwood, 1993a, 1993b; Malan, Van der Merwe, Huisman & Kruger, 1992; Mills, Berry, Dimsdale, Nelesen & Ziegler, 1993). It has been demonstrated that black adult males generally evidenced higher

total peripheral resistance, whereas white adult males evidenced greater HR and cardiac output increases (Light et al., 1993a). A similar pattern was shown for the female groups. Other research has indicated that black male college students had significantly elevated BP during a cold pressor test compared to white college students (Anderson et al., 1989). Cardiovascular responses of black undergraduate students have been demonstrated to be higher than those of white and Asian undergraduate students when posture changed from sitting to standing (Goldstein & Shapiro, 1995). In addition, work BP has been differentially predicted from laboratory BP according to the race of the participants (Light et al., 1993b). Further, it has been shown that home versus work differences in SBP and DBP were significantly greater in white adults compared to black adults (Gellman et al., 1990).

The results of research on race and cardiovascular responses to stress indicated that context was important. The relationship between race and cardiovascular reactivity has been demonstrated to be dependent on the stressor (Malan et al., 1992). Blacks appeared to be more responsive to laboratory stressors, while whites were more responsive to natural stressors, as evidenced by results obtained for work situations. It has been suggested that differences in cardiovascular reactivity in different races of people can be partially attributed to differential beta-receptor activity and sensitivity (Girdler, Hinderliter & Light, 1993).

Research investigating the effects of caffeine indicated that this substance produced significant elevations in SBP and DBP, and these effects were additive to the pressor effects of stress and anxiety (James, 1991). Other research has shown that the effects of caffeine were additive when administered to a group of students undergoing a stressful examination (Pincomb et al., 1987). Together, the exam and the caffeine increased the number of male participants displaying increased SBP in the borderline hypertensive range. It was concluded that caffeine used

during periods of stress increased the cumulative stress response. Further, nicotine has been demonstrated to increase HR (Domino, Riskalla, Zhang & Kim, 1992; Krebs, Petros & Beckwith, 1994; Pritchard, Robinson, deBethizy, Davis & Stiles, 1995; Rose & Behm, 1991). Thus, it was evident that researchers must monitor participants' intake of caffeine and nicotine for periods of time prior to and during research.

Posture has been shown to affect BP. It has been demonstrated that of the factors that can influence BP, the most significant contribution was made by posture (Gellman et al., 1990). In this study, 33% and 47% of the within subject variance for SBP and DBP, respectively, was explained by posture. BP increased when people moved from lying down to sitting, and further increased when they stood. The implication of this research was that the results of stress studies may be confounded by the posture of the individual when measurements were taken. Therefore, posture must be controlled for in studies employing measures of BP (Gellman et al., 1990; Goldstein et al., 1992).

It also has been established that time of day affected BP (Pickering, 1988) and HR (Mavjee & Horne, 1994). BP has been demonstrated to be lower during the night compared to during daytime hours (Kennedy, Horan, Sprague, Padgett & Shriver, 1983; Millar-Craig, Bishop & Raftery, 1978; Pickering, 1988). Whereas it has been previously postulated that it was a natural diurnal circadian rhythm which resulted in the different levels of BP across the day and night (Millar-Craig et al., 1978), others have postulated that it was the sleep-wakefulness cycle that was responsible for these changes (Clark et al., 1987; Pickering, 1988). Research using modelling analyses suggested that activity was a more powerful predictor of BP than time of day (Clark et al., 1987). However, whether it be explained by circadian rhythm or by physical activity, BP and HR do change across a 24 hour cycle.

In addition to the individual effects of each of these variables on HR and BP, there was evidence to suggest that interactions occurred between variables. For example, it has been demonstrated that race and hypertension (Mills et al., 1993), race and gender (Goldstein & Shapiro, 1995; Light et al., 1993a), race and family history of hypertension (Goldstein & Shapiro, 1995) and caffeine and nicotine (Gilbert, Robinson, Chamberlin & Spielberger, 1989) interacted when people were under stress.

When using cardiovascular indices of stress, it has been shown to be important to take multiple measurements because cardiovascular measurements varied greatly, even over short periods of time (Fried et al., 1984). Measurement of baseline cardiovascular functioning was vital because researchers needed to examine reactivity, or levels of responding. Thus, researchers needed baseline measurements with which to compare HR and BP (Balick & Herd, 1987; Fleming & Baum, 1987). It has been recommended that participants acted as their own controls because of the large inter-individual differences in HR and BP (Balick & Herd, 1987). A within-subjects design should be used when researchers were including psychophysiological measures in their research. However, this design was not at the expense of a between-subjects design, which has been used to compare the relative stressfulness of a particular occupation. Therefore, it appeared necessary to have a within- and a between-subjects design in occupational stress research.

By controlling for the many factors that have been demonstrated to affect cardiovascular reactivity, and by having baseline measurements to which participants' responses could be compared, researchers would be much closer to obtaining reliable measures of stress-related responses.

2.3 Acute versus chronic stress

It has been accepted among stress researchers that a problem exists regarding the lack of a commonly agreed definition of stress (Dobson, 1982; Farmer, 1990; Ursin, 1982). Linked with this problem were the concepts of acute and chronic stress (Farmer, 1990). Acute stress has been described as high-order stress that was situation specific, whereas chronic stress was low-level stress stemming from persistent routine activities (Derogatis & Coons, 1993; Farmer, 1990; Lazarus & Folkman, 1984). The duration of a stressful encounter has been considered to have implications with respect to cognitive appraisal, or one's interpretation of the encounter (Lazarus & Folkman, 1984). For example, chronic stressors did not allow an individual time off from the stressful encounter. Under such circumstances, individuals were likely to interpret the encounters as threatening to one's well being (Lazarus & Folkman, 1984).

Results of a community survey of men and women demonstrated that chronic stress predicted depressive symptoms more powerfully than acute stress (McGonagle & Kessler, 1990). There was a general pattern of negative interactions between chronic stress and acute stress in predicting depressive symptoms, implying that the depression created by acute stress generally was less pronounced among people with pre-existing chronic problems. Both acute and chronic stress have been implicated in depression in adolescence (Daniels & Moos, 1990).

Chronic and acute stressors have been demonstrated to have differential effects on psychophysiology. For example, undergraduate students were monitored over a 2 week period, during which an examination was experienced (Stock, Zimmerman & Teuchert-Noodt, 1993). The time surrounding the examination was regarded as chronic stress, whereas the examination itself was an acute stressor. Results demonstrated that chronic stress was associated with

increased nocturnal adrenalin excretion, whereas the acute stressor was associated with an 18-fold increase in adrenalin and a 2-fold increase in noradrenalin excretion compared to baseline levels. In a review examining lipid changes during stressful experiences, it was demonstrated that mild forms of chronic stress were not associated with changes in lipids and lipoproteins (Niaura, Stoney & Herbert, 1992). Acute laboratory stressors, however, were frequently associated with short-term alterations in lipids and lipoproteins. A review of the link between stress and immune function has demonstrated that acute stressors have produced mixed effects on immunity (O'Leary, 1990). It was hypothesised that these effects resulted from differential activation of physiological stress symptoms. Chronic stress has been associated with the suppression of immune function. There was evidence that the immune system may not adapt to chronic stress.

In a study of computer workers, conducted over a 2 week period, both chronic and acute stress were monitored (Eden, 1990). Results demonstrated that the acute stressor of a computer shutdown led to higher psychological and cardiovascular responses compared to routine work events. Other research has demonstrated that chronic stress was a factor that degenerated workers' conditioning to task demands (Schaubroeck & Ganster, 1993).

The importance of the two types of stress has been reflected in the stress programmes offered to workers. For example, critical incident stress debriefing (CISD) procedures were aimed at dealing with acute stress (Mitchell & Everly, 1995; Smith & de Chesnay, 1994), whereas employee assistance programmes were aimed at dealing with the effects of chronic stress (Delaney, 1987).

It has been contended that many sources of occupational stress were chronic rather than acute, although most research appeared to have focused on acute rather than chronic stressors (Fleming & Baum, 1987). At the very least, researchers must acknowledge that the two types of stress exist, and at best, researchers should address both issues, or risk presenting a narrow view of the stress process

(Farmer, 1990). Dewe (1991a) suggested that future research should differentiate acute stressors from chronic stressors.

2.4 Work days versus nonwork days

One method of investigating the stress involved in particular occupations has compared work days with nonwork days, with higher psychophysiological responses at work indicating the physical and emotional demands of the occupation (Goldstein et al., 1992). Higher work day BP compared with nonwork days has been demonstrated in normotensive and hypertensive workers (Harshfield, Pickering, Kleinert, Blank & Laragh, 1982; Theorell, Knox, Svensson & Waller, 1985), white collar workers (Frankenhaeuser et al., 1989) and male firefighters (Steptoe et al., 1996). For example, in a study comparing male and female managers and clerical workers (Frankenhaeuser et al., 1989), participants measured their SBP, DBP, and HR every hour from 9 a.m. to 5 p.m. during their work day, and from 6 p.m. until 9 p.m. after work had ended. On the nonwork day, participants followed the same schedule. Results demonstrated that for all groups of workers, SBP, DBP and, to a lesser extent, HR were significantly elevated at work compared to the nonwork day. BP was particularly high at the 9 a.m. measurement at work. Interestingly, a sex difference was evident for the managers once work had ended. Responses decreased after work for the male managers, whereas responses remained high for the female managers. Thus, this methodology not only was sensitive to differences between days, but also between different groups of workers.

Assembly line workers' psychophysiological responses were monitored during a 2 hour period on 2 consecutive work days, and during a 2 hour period off work with pay. Results demonstrated that work induced a significant elevation on

almost all measures of arousal, including SBP, DBP and HR (Lundberg et al., 1989).

One limitation of previous research (Frankenhaeuser et al., 1989; Lundberg et al., 1989) was that participants were instructed to refrain from physical activity during the nonwork periods. Undoubtedly, this approach delineated arousal differences between work activities and rest, and allowed researchers to have a baseline to which psychophysiological responses could be compared. However, it did not allow the investigation of natural work/nonwork day differences to be examined. Thus, these studies have demonstrated differences in arousal between work and rest, rather than differences between work and nonwork activities.

In response to this limitation, Steptoe et al. (1996) measured BP in 49 British firefighters on a work day and a nonwork day, with participants engaging in normal activities on the nonwork day. BP also was measured when the firefighters were resting at work. These BP values were very similar to the nonwork day measures. Results indicated that BP was significantly higher on the work day. Whereas no indication was given of the types of activities engaged in on the nonwork day, results indicated that activity levels were lower on the nonwork day. Importantly, the higher activity levels on the work day did not statistically account for all the variance detected between the two types of days. It was concluded from this study that physical activity does not account for all the differences detected between work and nonwork days. This research supported the contention that higher psychophysiological and subjective measures at work reflected the stress experienced as a function of the occupation.

Although not collecting data on a day off, a study using medical students compared cardiovascular responses during a high and a low stress day (Sausen et al., 1992). Ambulatory recordings of BP and HR were taken on a day of an examination (high stress) and a day during which students attended lectures (low stress). Results indicated higher SBP, DBP and HR on the day of the examination

compared to a day of lectures. Thus, a difference has been demonstrated between different types of days for medical students. A similar increase in measures was evident for catecholamines and lipids for a group of psychologists and doctors when they were monitored speaking in public compared to a normal day at work (Bolm-Audorff et al., 1989).

Of course, when employing a methodology based on psychophysiological responses to work and home, contradictory results have been reported (Kennedy et al., 1983; Pickering, Harshfield, Kleinert, Blank & Laragh, 1982). Explanations for these results have been postulated. For example, failure to account for posture in such studies may account for the lack of a difference between work and home settings. Indeed, BP was higher at work than at home when posture was controlled (Gellman et al., 1990).

However, a study of paramedics in which posture was monitored did not demonstrate a work-home difference (Goldstein et al., 1992). Ambulatory recordings of BP over 2 days did not differentiate between a day at work and a day away from work. However, results indicated elevated BP in association with specific events in the work of paramedics. For example, when paramedics were riding in an ambulance, SBP was 9.8 mmHg higher than when they were riding in a car on their day off work. Similarly, when the paramedics were at the hospital, SBP was 7.2 mmHg higher than when they were at places such as a shopping centre or restaurant on their nonwork day. Thus, in this study, higher BP was associated with specific work events and situations, rather than being generally elevated at work compared with home.

A further limitation of previous research (Frankenhaeuser et al., 1989; Goldstein et al., 1992; Lundberg et al., 1989; Steptoe et al., 1996) concerned the length of time participants were monitored. The period of time monitored in studies employing this methodology ranged from 6 hours (Lundberg et al., 1989) to 24 hours (Goldstein et al., 1992). In such research "there is no control over what

happens during any one period of recording or whether the day will be typical and provide multiple instances of representative stressful events" (Shapiro, Goldstein & Jamner, 1994, p. 72). Researchers have attempted to overcome this difficulty in a number of ways. For example, Frankenhaeuser et al. (1989) studied different workers on different days. Consequently, the variations between different work days may be reflected in the measurements of different workers. It should be acknowledged, however, that individual differences have been demonstrated in response to stress (Arena, Goldberg, Saul & Hobbs, 1989; Balick & Herd, 1987; Cacioppo, 1994; Lane, Adcock & Burnett, 1992; Sausen, Lovallo & Wilson, 1991; Sherwood, Royal & Light, 1993; Shostak & Peterson, 1990; Uchino, Cacioppo, Malarkey & Glaser, 1995; Walsh, Wilding & Eysenck, 1994) and in what was cognitively appraised as stressful by individuals (Croyle, 1992; Dewe, 1991b, 1992; Folkman, Lazarus, Dunkel-Schetter, et al., 1986; Folkman, Lazarus, Gruen & DeLongis, 1986; Gadzella et al., 1991; Larsson et al., 1988; Lazarus & Folkman, 1984; Ptacek, Smith & Zanas, 1992). Thus, to fully capture the differences between work days, the same worker should be measured on different work days. Lundberg et al. (1989) monitored workers for short periods of time over two consecutive work days and a third nonwork day. Results demonstrated differences between work days rated as "good" and as "bad". The authors suggested that measurements should be taken over several days in order to determine stress levels in employees at work. Others have recommended researchers study "a single occupation in which stressful events are relatively pervasive and uniform from one person to the next" (Shapiro et al., 1994, p. 73).

However, not all occupations can be described in such a way. For example, much of police work involved waiting for something to happen. Police work involved boredom, which could be replaced by tension because the police officers did not know when or what the next call will be (Mann & Neece, 1990). Some police researchers have argued that dangerous situations evoked feelings of

excitement and exhilaration and gave meaning to an otherwise rather boring, mundane job (Jermier, Gaines & McIntosh, 1989).

Goldstein et al.'s (1992) approach, using a single occupation to overcome the difficulties of a typical work day, was limited in that it did not allow for comparisons between occupations. There was no scope for the use of comparison groups. It has been regarded as necessary to determine if one occupation was more stressful than another and this could only be achieved by making comparisons between occupational groups. This has been linked to the assumption that some occupations were associated with high levels of stress. Law enforcement has been postulated to be one such occupation.

2.5 Summary

It was evident that researchers have been moving toward using a combination of psychological and psychophysiological measures of stress. The most commonly employed psychophysiological measurements of stress were BP and HR. There were a number of factors that must be considered when utilising cardiovascular measurements of stress, including age, gender, family history of hypertension and caffeine and nicotine intake. A relatively new methodology for investigating occupational stress compared responses on work days to nonwork days. Stress at work has been reflected in higher psychological and psychophysiological responses on work days compared to nonwork days. However, three problems existed in the research, reported in the current literature, using this methodology. First, because of the requirements of participants to relax and avoid physical activities on nonwork days, most investigators have demonstrated the differences between work and rest, rather than work and nonwork days. Second, the duration of the research conducted so far has been short, and has not allowed researchers to demonstrate differences between work

days. Third, previous research has rarely utilised comparison groups. It was evident that these issues needed to be addressed in future research.

CHAPTER THREE

POLICE STRESS

3. POLICE STRESS

3.1 Consequences of police stress

As society has placed increased demands and expectations upon its police personnel, the personal and professional costs have escalated (Sewell, 1983). The stress has been experienced by the police officers themselves, and has extended to their families, police administrators and, ultimately, the taxpayer (Haines, Williams & Woo, 1996b). From the perspective of the police organisation, stress has taken its toll through losses of police officer efficiency; complaints from the public; lawsuits resulting from police malpractice; worker's compensation claims; disability retirements; and burned-out personnel in supervisory and management positions who have created still more stress in their subordinates, peers and commanding officers (Sewell, 1983). High levels of stress among police officers also has been associated with increased absenteeism (Tang & Hammontree, 1992). Police officers on official stress-related leave have proven costly to the Tasmanian state government (Haines et al., 1996a). Further, stress-related retirements, at all levels of the police organisation, have been shown to be high. Over a decade ago, the financial cost of seven police officers and administrators in the United States who retired early was $US2.3 million (White et al., 1981). With approximately 50% of police officers in California having retired on stress-related disabilities (Stratton, 1986), the high cost to the police organisation and the tax payer was evident.

One consequence of police stress has been the proliferation of research investigating this phenomenon. Table 1 details a range of studies which have investigated various aspects of police stress. Such research has examined the impact of occupational stress on police officers and their families, the causes of this stress, factors which influenced the stress experienced, and the ways in which

Table 1. Summary of police stress research.

Authors	Year	Research Focus	Sex	Self Report	Objective Measures	Physiology Measures	Control Measures	Comparison Groups	Inferential Statistics
Kroes, Margolis & Hurrell	1974	Stressors Quality of Life	M	X					
Lester & Mink	1979	Psychopathology/ Symptomatology Quality of Life	M	X				Clerical	X
Fell, Richard & Wallace	1980	Physical Health Psychopathology/ Symptomatology	M/F		Death Certificates; Patients' Records			Various (130)	X
Lester & Gallagher	1980	Psychopathology/ Symptomatology	M	X				Managers	X
Maynard, Maynard, McCubbin & Shao	1980	Coping	M	X					X
Lester, Benkovich, Brady, Dietrich & Solis	1981	Psychopathology/ Symptomatology Age Differences Quality of Life	M	X	Weight			Police; Normative Data	X
White, Olson & Knowles	1981	Psychopathology/ Symptomatology Career Stage	M	X					
Fagan & Ayers	1982	Career Stage Age Differences	M	X					

Table 1 continued

Hageman	1982	Physical Health Career Stage				Vitamin C; B6 & Zinc		
Jackson & Maslach	1982	Coping Psychopathology/ Symptomatology Quality of Life	M	X				X
Lester	1982a	Age Differences		X				X
Lester	1982b	Stressors		X			Police	X
Lester, Butler, Dalley, Lewis & Swanton	1982	Personality		X			Police	X
Maynard & Maynard	1982	Coping Quality of Life	M/W	X				X
Gaines & Jermier	1983	Psychopathology/ Symptomatology Career Stage Sex Differences	M/F	X			Police; Support Workers	
Honig & Reiser	1983	Psychopathology/ Symptomatology Physical Health	M/F		Officers' Files		Police	X
Peacock, Glube, Miller & Clune	1983	Stressors		X	Critical Flicker Fusion Frequency; Grammatical Reasoning	Cardiorespiratory fitness; BP; Catecholamines; Temperature	Police	X
Sewell	1983	Stressors		X				

Table 1 continued

Violanti & Marshall	1983	Stressors Coping		X			X
Violanti, Marshall & Howe	1983	Coping		X			X
Bennett	1984	Personality		X		Police	X
DeLey	1984	Police Organisation Stressors			Police Records	Police	
Inwald & Shusman	1984	Personality Sex Differences	M/F	X			
Lawrence	1984	Stressors Personality	M	X			X
Mahanta & Kathpalia	1984	Personality		X		Judges; Prison Officers	X
Pendergrass & Ostrove	1984	Stressors Psychopathology/ Symptomatology Physical Health Sex Differences	M/F	X		Support Staff	X
Stratton, Parker & Snibbe	1984	Psychopathology/ Symptomatology		X			
Kirmeyer & Diamond	1985	Appraisal Coping Personality	M/F	X		Police	X

Table 1 continued

Kreitner, Sova, Wood, Friedman & Reif	1985	Physical Health	M	X	Skinfold; BP; Lung Function; Cholesterol; Glucose	Police	
Violanti, Marshall & Howe	1985	Coping		X			X
White, Lawrence, Biggerstaff & Grubb	1985	Career Stage Age Differences Sex Differences	M/F	X			X
Burke & Deszca	1986	Psychopathology/ Symptomatology	M/F	X			X
Elliott, Bingham, Nielsen & Warner	1986	Coping Quality of Life		X			X
Ely & Mostardi	1986	Physical Health	M	X	BP; ECG; Catecholamines; Lipids	Clerical	X
Farkas	1986	Stressors Psychopathology/ Symptomatology Quality of Life	M/F	X		Police	X
Graf	1986	Coping		X			X
Loo	1986	Psychopathology/ Symptomatology		X			
Madamba	1986	Quality of Life	M	X			X

Table 1 continued

Martin, McKean & Veltkamp	1986	Psychopathology/ Symptomatology Sex Differences	M/F	X					X
O'Connell, Holzman & Armandi	1986	Career Stage		X					
Pendergrass & Ostrove	1986	Psychopathology/ Symptomatology Sex Differences	M/F	X	Investigations by Internal Affairs; Light Duty Assignment			Support Staff; Normative Data	X
Burke	1987a	Psychopathology/ Symptomatology Career Stage Age	M/F	X					X
Fusilier, Ganster & Mayes	1987	Psychopathology/ Symptomatology Physical Health Coping Personality	M/F	X		Epinephrine		Firefighters	X
Grennan	1987	Sex Differences	M/F	X	Police Reports				X
Weisheit	1987	Sex Differences	M/F	X					X
Williams, Petratis, Baechle, Ryschon, Campain & Sketch	1987	Physical Health Age	M	X		HR; BP; Body Fat; Cholesterol		Police	X
Beutler, Nussbaum & Meredith	1988	Psychopathology/ Symptomatology Career Stage	M	X			0, 2 & 4 years		X

Table 1 continued

Bruns & Shuman	1988	Police Organisation		X				
Burke	1988a	Quality of Life	M/F	X				X
Burke	1988b	Personality	M/F	X				X
Burke & Deszca	1988	Psychopathology/ Symptomatology	M/F	X				X
Fain & McCormick	1988	Coping Career Stage Sex Differences	M/F	X			Police	X
Hiatt & Hargrave	1988	Personality		X	Psychological Assessment		Police	X
Kirmeyer & Dougherty	1988	Coping	M/F	X	Workload from Observations			X
Larsson, Kempe & Starrin	1988	Stressors Appraisal Coping Career Stage Age	M/F	X				X
McCammon, Durham, Allison & Williamson	1988	Coping Psychopathology/ Symptomatology	M/F	X			Medical Staff	X
Norvell, Belles & Hills	1988	Psychopathology/ Symptomatology Physical Health	M	X		BP	Normative Data	X

Table 1 continued

Shernock	1988	Personality		X				X
Sigler & Wilson	1988	Psychopathology/ Symptomatology Quality of Life	M/F	X			Teachers	X
Steinman	1988	Police Organisation		X			Police	X
Burke	1989a	Career Stage	M/F	X				X
Burke	1989b	Career Stage	M/F	X			Police	X
Jermier, Gaines & McIntosh	1989	Stressors Psychopathology/ Symptomatology Age Sex Differences	M/F	X			Police; Clerical	X
Kaufmann & Beehr	1989	Coping Career Stage		X			Police	X
Stotland & Pendleton	1989	Psychopathology/ Symptomatology Quality of Life	M/F	X	Official Sick Days; Avoidable Car Accidents; Work Load; Citizen Complaints	BP	Police	X
Arcuri & Lester	1990	Stressors	M	X				X

Table 1 continued

Brown & Campbell	1990	Stressors Psychopathology/ Symptomatology Physical Health Career Stage	M/F	X				Normative Data	X
Burke & Kirchmeyer	1990	Psychopathology/ Symptomatology Quality of Life		X	Sick Leave				
Grant, Garrison & McCormick	1990	Stressors Career Stage	F	X					X
Josephson & Reiser	1990	Psychopathology/ Symptomatology	M/F		Death Certificates			Normative Data	
Koslowsky	1990	Personality	M/F	X					X
Lester & Pitts	1990	Psychopathology/ Symptomatology Personality	M/F	X					X
Norris, Carroll & Cochrane	1990	Coping Psychopathology/ Symptomatology Physical Health	M	X		HR; BP	X	Police	X
Quire & Blount	1990	Physical Health Age Differences	M		Coronary Risk Profile	Cholesterol		Police	X

Table 1 continued

Regoli, Culbertson, Crank & Powell	1990	Career Stage	M/F	X					
Saathoff & Buckman	1990	Psychopathology/ Symptomatology	M/F		Psychiatric Evaluations				
Stearns & Moore	1990	Psychopathology/ Symptomatology Career Stage Sex Differences	M/F	X				Police; Clerical; Normative Data	X
Alexander & Wells	1991	Psychopathology/ Symptomatology Coping		X	Sick leave		Pre/Post	Police	
Crank & Caldero	1991	Stressors Quality of Life	M/F	X					
Duckworth	1991	Psychopathology/ Symptomatology		X				Police	
Hills & Norvell	1991	Psychopathology/ Symptomatology	M	X				Normative Data	
Mayes, Barton & Ganster	1991	Age	M/F	X	Employer Ratings of Performance	Adrenalin; Noradrenalin	Baseline		X
Thompson & Solomon	1991	Psychopathology/ Symptomatology Personality	M/F	X	Sick Leave			Normative Data	X

Table 1 continued

Bartol, Bergen, Volckens & Knoras	1992	Stressors Sex Differences	M/F	X	Psychological Evaluations; Supervisory Stress & Performance Ratings		Police	
Pierce & Dunham	1992	Stressors	M/F	X				X
Alexander	1993	Psychopathology/ Symptomatology		X		Pre/post	Police	X
Brandt	1993	Stressors Personality	M/F	X				X
Brown & Fielding	1993	Sex Differences	M/F	X				X
Burke	1993a	Psychopathology/ Symptomatology Career Stage Age	M/F	X				X
Burke	1993b	Psychopathology/ Symptomatology Coping Career Stage Age	M/F	X	Sick Days			X
Evans & Coman	1993	Stressors Psychopathology/ Symptomatology Personality	M/F	X				X

Table 1 continued

Evans, Coman, Stanley & Burrows	1993	Coping	M/F	X			
Kirkcaldy	1993	Stressors Coping Psychopathology/ Symptomatology Personality Quality of Life	M/F	X		Police; Normative Data	X
Kirkcaldy, Shephard & Cooper	1993	Coping	M/F	X		Police	X
Lester	1993	Psychopathology/ Symptomatology	M		Police Files		X
Stearns & Moore	1993	Psychopathology/ Symptomatology	M/F	X			X
Stradling, Crowe & Tuohy	1993	Personality Age	M	X		Police	X
Violanti & Aron	1993	Stressors Psychopathology/ Symptomatology		X			X
Alexander & Walker	1994	Coping Career Stage Sex Differences	M/F	X			X

Table 1 continued

Cooper, Kirkcaldy & Brown	1994	Psychopathology/ Symptomatology Coping Physical Health Personality Quality of Life	M/F	X			X
Doctor, Curtis & Isaacs	1994	Stressors Psychopathology/ Symptomatology Quality of Life	M/F	X	Sick Leave		X
Follette, Polusny & Milbeck	1994	Coping Psychopathology/ Symptomatology	M/F	X		Mental Health Professionals	X
Janik & Kravitz	1994	Psychopathology/ Symptomatology	M/F		Police Records		X
Kirkcaldy, Brown & Cooper	1994	Psychopathology/ Symptomatology Coping Personality		X		Police	X
Kirkcaldy, Cooper, Brown & Athanasou	1994	Physical Health	M/F	X	Absenteeism	Police	X
Kirkcaldy, Cooper, Eysenck & Brown	1994	Coping Psychopathology/ Symptomatology	M/F	X			X
Perrott & Taylor	1994	Personality	M/F	X		Normative Data	X

Table 1 continued

Smith & de Chesnay	1994	Psychopathology/ Symptomatology	M/F	X				
Young	1994	Physical Health Age	M	X		Blood Pressure; Cholesterol; Oxygen Uptake		X
Beehr, Johnson & Nieva	1995	Coping	M/F	X				X
Crank, Regoli, Hewitt & Culbertson	1995	Stressors		X				X
Hart, Wearing & Headey	1995	Psychopathology/ Symptomatology Coping	M/F	X			Police; Teachers; Students; Normative Data	X
Holaday, Warren-Miller, Smith & Yost	1995	Coping		X			University Personnel; Workshop Attendants; Medical Personnel; Fire Officers	X
Kornfeld	1995	Personality	M/F	X				
Kuch, Travis & Collins	1995	Psychopathology/ Symptomatology	M/F		Clinical Diagnoses			
Macleod	1995	Psychopathology/ Symptomatology			Psychiatrist Records			

Table 1 continued

Brown, Cooper & Kirkcaldy	1996	Stressors Coping Personality Quality of Life Career Stage	M/F	X		Police	X
Carlier, Lamberts, Fouwels & Gersons	1996	Psychopathology/ Symptomatology	M/F	X	Clinical Diagnoses	Police	X
Marmar, Weiss, Metzler, Ronfeldt & Foreman	1996	Psychopathology/ Symptomatology	M/F	X		Police; Firefighters; Paramedics; Road Workers	X
Sinnett, Holen & Heil	1996	Personality	M		Pre-selection Files	Normative Data	X
Storch & Panzarella	1996	Stressors Psychopathology/ Symptomatology	M	X		Police	X
Tang & Lau	1996	Psychopathology/ Symptomatology	M/F	X		Nurses; Teachers	X
Wearing & Hart	1996	Coping Appraisal	M/F	X			X

Note. M = Male; F = Female; W = Wives

police officers coped with stress. Each of these areas of research will be reviewed here, with the exception of coping, which will be reviewed in Chapter Five. Further, a critique of this research will be provided at the end of this chapter. Inspection of the literature indicated that similar limitations were evident across all areas of research. Thus, to avoid repetition, a consolidated critique will be provided in one section.

3.2 Impact of occupational stress on police officers

In addition to the police organisation bearing costs associated with stress, the police officers themselves, and their families, appeared to have paid a high price. Many studies have highlighted the physiological and psychological consequences of police stress (e.g., Brown & Campbell, 1990; Ely & Mostardi, 1986; Kroes et al., 1974; Mann & Neece, 1990; Martin et al., 1986). It was evident from the focus of research documented in Table 1 that approximately 71% of this research has investigated the consequences of police stress, with the majority focusing on psychopathology and symptomatology (46%). Such research also has investigated the impact of police stress on the police officers' physical health (12%) and on the police officers' quality of life (12%).

3.2.1 Psychopathology and symptomatology

As noted, the majority of research conducted on the consequences of police stress has examined the areas of psychopathology and symptomatology (e.g., Alexander, 1993; Brown & Campbell, 1990; Duckworth, 1991; Smith and de Chesnay, 1994; Stearns & Moore, 1990, 1993; Tang & Lau, 1996; Thompson & Solomon, 1991). These two areas have been used to refer to the psychological changes detected in police officers due to exposure to their work. Specifically,

psychopathology has been defined as the scientific study of the nature and development of mental disorders (Davison & Neale, 1994; Reber, 1985). The term symptomatology has been employed here to denote the experience of psychological symptoms, such as anxiety, in the absence of the report of a psychiatric condition. Both psychopathology and symptomatology have been utilised to demonstrate the impact of police work on police officers. Researchers have investigated levels of anxiety (e.g., Alexander, 1993; Brown & Campbell, 1990; Doctor, Curtis & Isaacs, 1994; Evans & Coman, 1993; Fell et al., 1980; Follette et al., 1994; Hart et al., 1995; Lester, Benkovich, Brady, Dietrich & Solis, 1981; Norris et al., 1990; Storch & Panzarella, 1996; Thompson & Solomon, 1991; Violanti & Aron, 1993), burnout (e.g., Burke, 1987a, 1993a; Gaines & Jermier, 1983; Stearns & Moore, 1990, 1993; Tang & Lau, 1996), post-traumatic stress disorder (PTSD) (e.g., Carlier et al., 1996; Follette et al., 1994; Kuch et al., 1995), changes in personality (Beutler et al., 1988), alcohol and drug use (e.g., Beutler et al., 1988; Farkas, 1986; Pendergrass & Ostrove, 1986) and suicide (Fell et al., 1980; Janik & Kravtiz, 1994; Josephson & Reiser, 1990; Lester, 1993).

Anxiety and Stress

When examining the anxiety and distress levels of police officers, different versions of two measures have been used by a number of studies: the General Health Questionnaire (GHQ) (e.g., Goldberg & Hillier, 1979) and the State-Trait Anxiety Inventory (STAI) (e.g., Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983). The GHQ has been widely used as a screening instrument because it can indicate the probability that an individual has a psychiatric disorder (Thompson & Solomon, 1991). A score of 5 or more has been recommended as being suggestive of the presence of a psychiatric disorder. Mean scores for police samples have been demonstrated to be as low as 1.9 (Thompson & Solomon, 1991) and 3 (Doctor et al., 1994) and as high as 17.9 (Norris et al., 1990). This difference was

extremely large, and in all likelihood reflected factors associated with individual samples. The percentage of psychiatric morbidity of police officers, as evidenced by the number of cases identified, has ranged from 16% (Thompson & Solomon, 1991) to 22 % (Brown & Campbell, 1990) and 24% (Doctor et al., 1994). Research has demonstrated that psychological disturbance arising from nondisaster police experiences can be just as severe as psychological disturbance arising from attending disasters such as the Bradford fire (Duckworth, 1991). Other research has demonstrated that stress arising from police work was positively correlated with scores on the GHQ (Norris et al., 1990).

As noted, police researchers also have used the STAI. Mean scores for the Trait scale have been reported as 31 (Storch & Panzarella, 1996) and for the State scale as 31 (Storch & Panzarella, 1996) and 35 (Brown & Campbell, 1990). Storch and Panzarella noted that the mean scores of their American police officers (n = 79) were below those of the published norms, whereas Brown and Campbell argued that it was inappropriate to compare their scores to the norms because their sample was mostly male and had a truncated age distribution. Thus, there appeared to be difficulties in comparing police samples to normative data because of the characteristics of the samples used.

Researchers have employed other measures to demonstrate the impact of police work on the anxiety and stress levels of police officers. When examining the levels of perceived stress of police officers, it has been demonstrated that 1% experienced high levels, 20% moderate levels, and 79% low levels of stress (Lester et al., 1981). Other research indicated that police officers reported moderate levels of perceived stress (Hills & Norvell, 1991). Not surprisingly, research has indicated that police officers granted early pensions, due to stress, reported more anxiety and emotional instability than matched police officers still working (Honig & Reiser, 1983). It has been demonstrated that the levels of perceived stress reported by police officers were higher than those reported by teachers (Sigler &

Wilson, 1988). Further, research indicated that specific aspects of police work, such as body handling (Alexander & Wells, 1991; Thompson & Solomon, 1991) and undercover policing (Farkas, 1986), have an impact on the anxiety levels of police officers.

In summary, a number of researchers have demonstrated that police work impacts on the police officer through increased levels of anxiety and distress.

Burnout

Whereas the concept of burnout has been debated (Mitchell & Bray, 1989), a number of researchers have reported burnout to be associated with police work (Burke, 1987a, 1993a; Burke & Deszca, 1986; Burke & Kirchmeyer, 1990; Gaines & Jermier, 1983; Hills & Norvell, 1991; Jackson & Maslach, 1982; Jermier et al., 1989; Stearns & Moore, 1990, 1993; Tang & Lau, 1996). Burnout has been described as a syndrome which developed over time and was a result of cumulative stress (Mitchell & Bray, 1989). Symptoms have been understood to include emotional exhaustion, depersonalisation and reduced personal accomplishment (Maslach & Jackson, 1981). People who experienced burnout worked in occupations that involved interaction with other people in situations that often were emotionally charged (Maslach, 1982). Police work has been documented to be such an occupation.

It has been demonstrated that the majority of 828 Canadian police officers had either low or high levels of burnout, with the rest of the sample falling in between the two extremes (Burke & Deszca, 1986). However, it was evident that even those officers falling into the lowest group still displayed some symptoms of burnout. Different results were evident when consideration was given to the three dimensions of burnout. With regard to emotional exhaustion, low (Stearns & Moore, 1990) to moderate levels (Gaines & Jermier, 1983; Jackson & Maslach, 1982; Tang & Lau, 1996) have been reported. Moderate (Hills & Norvell, 1991;

Jackson & Maslach, 1982; Tang & Lau, 1996) to moderately high levels (Stearns & Moore, 1990) of depersonalisation were evident. The most consistently reported result has been that high levels of burnout were associated with a lack of personal accomplishment (Hills & Novell, 1991; Jackson & Maslach, 1982; Stearns & Moore, 1990; Tang & Lau, 1996). Thus, the evidence suggested that police officers experienced variable levels of burnout as a result of the work they performed. When considering the dimensions of burnout, evidence indicated that police officers experienced moderate levels of emotional exhaustion and depersonalisation and a low level of personal accomplishment.

The significance of experiencing burnout was further highlighted when the correlates of burnout were examined. Research indicated that increased levels of burnout in Canadian police officers were positively related to unhealthy behaviours such as excessive consumption of alcohol and coffee, smoking more and exercising less (Burke, 1987a; Burke & Deszca, 1986). The experience of burnout was associated with increased negative mood states and psychosomatic symptoms (Burke, 1987a). It also was associated with decreased job satisfaction (Burke, 1987a) and a decreased quality of life (Stearns & Moore, 1993). In particular, emotional exhaustion has been demonstrated to predict negative mood states, whereas a lack of personal accomplishment has been demonstrated to predict unhealthy behaviours (Burke, 1993b).

Two studies have demonstrated antecedents to burnout in police officers. One study clearly showed that perceived physical danger predicted emotional exhaustion (Jermier et al., 1989). The other study indicated that initial career orientation was important (Burke & Kirchmeyer, 1990). People who were idealists and joined the police force to change society and to make a difference were more likely to experience burnout than people who joined for other reasons.

In summary, there were ample data to suggest that police officers experienced burnout as a consequence of the work they performed. Burnout was important not

only because it was a direct consequence of police stress, but also because of its relationship with aspects of poor psychological and physical health.

Post-Traumatic Stress Disorder

The examination of PTSD as a consequence of police work has received attention in recent years (Carlier et al., 1996; Follette et al., 1994; Kuch et al., 1995; Loo, 1986; Macleod, 1995; Martin et al., 1986; McCammon, Durham, Allison & Williamson, 1988; Saathoff & Buckman, 1990; Smith & de Chesnay, 1994; Stratton, Parker & Snibbe, 1984). Martin and colleagues (1986) investigated the stress associated with working with victims of both crime and accidents. In this sample of 53 American police officers, the development of PTSD was strongly related to exposure to trauma relating to personal or others' victimisation. An increase in reporting psychological symptoms followed stressors involving threat to the police officer or their family, and situations involving victims of child abuse, domestic violence and rape. The symptoms reported by 26% of the sample met the criteria for a diagnosis of PTSD. It was demonstrated that the most frequently reported symptom of PTSD was the recurrent and intrusive recollection of the stressful event. PTSD symptoms were exacerbated by the fact that police officers were frequently exposed to situations that reminded them of the original trauma, and had little chance to distance themselves from the trauma. Furthermore, it was demonstrated that police officers who were exposed to multiple stressful events had an increased risk of developing PTSD.

The relationship between PTSD and being repeatedly exposed to similar situations was highlighted in another study of American police officers (n = 46) (Follette et al., 1994). The study demonstrated that 40% of female police officers and 17% of male police officers working on sexual abuse cases had a history of being abused themselves. The incidence of sexual abuse among the male police officers in this study was in the mid range of incidences of male sexual abuse

generally cited in the literature, from 6% (Wellman, 1993) through 16% (Finkelhor, Hotaling, Lewis & Smith, 1990; see Genuis, Thomlinson & Bagley, 1991 for review) to 29% (Collings, 1991). The incidence of sexual abuse among the female police officers however, was higher, compared to those reported in the literature pertaining to populations other than police, which ranged from 12% and 13% (Feldman, Feldman, Goodman & McGrath, 1991; Wellman, 1993) through 24% (Bergner, Delgado & Graybill, 1994) to 27% (Finkelhor et al., 1990). Thus, it appeared that previously abused female police officers were over represented in this type of police work. This may be of concern because police officers were increasing the risk of secondary traumatisation, despite the fact that this type of work had been sought by the police officers. Furthermore, police officers reported significantly more trauma symptoms and PTSD symptoms than a comparison group of mental health professionals engaged in the same type of work (Follette et al., 1994).

Other research has reported the prevalence of PTSD symptoms among American police officers (McCammon et al., 1988). Workers, including police officers, on a disaster site, following an explosion, reported significantly more PTSD symptoms than workers in a local hospital, dealing with victims of the explosion. Further, all of the workers, whose symptom constellations were consistent with diagnoses of PTSD, worked at the disaster site, not at the hospital. Although the sample used did not consist solely of police officers, the pattern of results has contributed to the growing evidence that police work can lead to PTSD in police officers.

Exposure to shooting incidents, and the development of PTSD, has been highlighted in three studies (Kuch et al., 1995; Loo, 1986; Stratton et al., 1984). Recent research indicated that most of the cases of PTSD in a Canadian sample of police officers resulted from exposure to life-threatening gunfire (Kuch et al., 1995). The role of the police officer in the shooting may have been as victim,

perpetrator, or witness to another police officer being shot. A wide range of symptoms were reported by the police officers. The most significant ones, reported by at least 80% of the sample, were recurrent dreams, intrusive recollections, distress when exposed to reminders, efforts to avoid thoughts and feelings, diminished interest in significant activities, estrangement from others, efforts to avoid activities or strangers, restricted range of affect, insomnia, irritability and hypervigilance.

The second study (Stratton et al., 1984) reported that the most common symptoms of PTSD were flashbacks and sleep problems, which were compounded by fear of legal entanglement. Many of the American police officers also experienced emotional reactions, including crying, anger, elation and depression. The results indicated that 75% of the police officers clearly recalled the events at a long-term followup, although the length of time between the shooting and testing was not specified. Thus, shooting events were traumatic experiences and clearly constituted significant emotional events.

The third study (Loo, 1986), utilising Canadian police officers, demonstrated that in the first 3 days following a shooting incident, 50% of the police officers reported sleep disturbance, 36% were preoccupied with the incident, 27% experienced flashbacks and 24% reported nightmares. Over the first month, these symptoms disappeared, suggesting the experience of an Acute Stress Disorder (American Psychiatric Association, 1994). However, after 1 month, 27% of the police officers reported re-examining their personal values, 23% were preoccupied with the incident, 21% experienced anger over the incident and 25% reported a loss of interest in work. All three studies have clearly demonstrated that shooting incidents were stressful to police officers, and related to the development of symptoms of PTSD.

The emotional reactions of police officers to a range of stressful situations were highlighted in a recent qualitative study involving interviews and case history

materials (Smith & de Chesnay, 1994). Documented reactions to stressful work situations included empathy for victims, helplessness, guilt for not being able to save a victim and anger at a perpetrator. Physical reactions of stress such as hypertension and gastrointestinal problems were common. Flashbacks were experienced long after the incident. The role of CISD procedures was explored, and it was concluded that CISD procedures effectively minimised the consequences of traumatic events at work for police officers.

A recent study has documented the prevalence of dissociative symptoms in three groups of Dutch police officers: those who had been clinically diagnosed with PTSD, those who reported some symptoms of PTSD but who did not meet the criteria for a diagnosis of the disorder, and those with no PTSD symptoms at all (Carlier et al., 1996). At 3 months and 12 months after the traumatic event, police officers with PTSD and some PTSD symptoms reported more dissociative symptoms than police officers with no PTSD symptoms. Regression analysis demonstrated that PTSD predicted dissociative symptoms, but that the reverse was not true. The results of this study also indicated that the symptoms of PTSD reported by police officers changed over time. Of the 50 police officers who did not show any PTSD symptoms at 3 months after the traumatic event, 94% continued to show no symptoms at 12 months, whereas 6% had some symptoms of PTSD. Of the 50 police officers with some symptoms of PTSD at 3 months, 48% reported no symptoms at 12 months, 50% continued to have some symptoms of PTSD, and 2% reported that their symptoms had developed and a diagnosis of PTSD was warranted. Of the 42 police officers who were clinically diagnosed with PTSD at 3 months, 21% had no symptoms at 12 months, 48% had some symptoms of PTSD and 31% reported no amelioration of symptoms. Thus, over the span of 9 months, the PTSD symptoms reported by police officers largely decreased, although there was an increase of reported symptoms for a small number of cases.

In summary, research has demonstrated that PTSD was a consequence of the work police officers performed. There were many symptoms reported by police officers following traumatic events, and these symptoms changed over time. One study has demonstrated the importance of CISD procedures in limiting the impact of PTSD in police officers. It should be noted, however, that consistent outcomes of the CISD process have yet to be established (Curtis, 1995).

Personality Traits

One study involving psychometric measures, including the Minnesota Multiphasic Personality Inventory and the MacAndrews Alcoholism Scale, demonstrated that police officers' personalities and behaviours changed (Beutler et al., 1988). After just 2 years in the police force, the police officers appeared to be responding negatively to the demands of the organisation by exhibiting addictive behavioural vulnerabilities to alcohol. After 4 years, the police officers evidenced further deterioration. Significant changes were evident on three measures, namely hypochondriasis, hysteria and alcoholism. Levels of psychopathology clearly increased over the 4 year period of study. It was concluded that these negative changes resulted from the cumulative nature of the stress associated with police work. This study demonstrated the negative effects that police work had on the police officers. It was evident that adverse psychological changes progressed as length of police service increased. It is to be noted that the sample of police officers included in this study was small. The study commenced with the files of 30 police officers. After 2 years, data were available for 25 police officers. At 4 years, data were available for just 11 police officers. The results of this study were therefore limited, at least in part, because of the small sample size.

Substance Use

The stress of police work has been linked to an excessive use of alcohol and drugs (Beutler et al., 1988; Farkas, 1986; Pendergrass & Ostrove, 1986; Smith & de Chesnay, 1994; Violanti, Marshall & Howe, 1983, 1985). As previously noted, research conducted over a 4 year period indicated that the vulnerability of the police officers to alcohol addiction was significantly higher after just 2 years in the police force (Beutler et al., 1988). Further, this vulnerability to alcohol addiction continued to rise significantly at 4 years after entry to the police force. American police officers have been shown to consume a significantly higher quantity of alcohol than the general population (Pendergrass & Ostrove, 1986). Other research has established a 1% increase in drug use during and after engagement in undercover work (Farkas, 1986). Further, police officers reported the overuse of alcohol following critical incidents (Smith & de Chesnay, 1994). Researchers employing path analysis have demonstrated that the psychological distress caused by police work was the greatest single antecedent of alcohol use by police officers (Violanti et al., 1983, 1985).

Two review articles (Dietrich & Smith, 1986; Machell, 1993) also highlighted alcohol and drug use among police officers. Dietrich and Smith indicated that both the police organisation and the operational demands of police work led to excessive alcohol and drug use. However, they concluded that little research had empirically investigated the prevalence of substance use among police officers. Comparative studies also were clearly lacking. Machell's review highlighted the use of alcohol as a maladaptive means of managing the symptoms of PTSD.

In summary, there appears to be a link between police stress and alcohol and drug use. Police officers were reported to use alcohol and drugs in an attempt to minimise the occupational stress experienced. Further, police officers reported using alcohol in response to the symptoms of PTSD which became evident following exposure to traumatic events.

Suicidal Behaviour

Police stress also has been linked to suicide (Fell et al., 1980; Janik & Kravitz, 1994; Josephson & Reiser, 1990; Lester, 1993). Researchers who analysed data on suicides, according to the occupation of the deceased, demonstrated that police officers ranked third out of 130 occupations (Fell et al., 1980). One limitation of this research, however, was that the authors did not indicate if the observed rate of police suicide was greater than the average population rate (Malloy & Mays, 1984). Other research indicated that the Los Angeles police department had a suicide rate of approximately 12 police officers per 100,000 (Josephson & Reiser, 1990). This rate was lower than that for adults at the county, state and national levels. This research established that the profile of a police officer who suicided was male, white, 35 years of age, worked patrol and abused alcohol. Further, he was separated or seeking a divorce and was experiencing a significant loss in his life. To a considerable extent, the description of the suicidal police officer was comparable to the profile of male suicides (Moscicki, 1995).

Strong evidence for the relationship between police stress and suicide was documented in a recent study (Janik & Kravitz, 1994). The sample consisted of 134 American police officers who had to present for evaluations to ascertain if they were fit for duty. Some 55% of these police officers had attempted suicide at some time in their lives. It was most likely that these police officers attempted suicide after joining the police force, because any record of attempted suicide, or any record of being admitted to a hospital or psychiatric institution for attempted suicide, would have resulted in the individuals not being accepted into the police force, assuming the police officer would have made it known at the time. In this study, attempted suicide was associated with the individual being suspended from work, the subject of citizen complaint, as well as experiencing marital problems. This was in keeping with the general precipitants of suicide (Moscicki, 1995).

Inconsistent with epidemiological studies on suicidal behaviour (Moscicki, 1995; Platt, 1992), more male police officers attempted suicide than females.

Lester (1993) conducted an historical study of 92 files, of New York City police officers who committed suicide, from 1934 to 1939. Results demonstrated that, prior to suicide, 25% were depressed, 18% had undergone a psychiatric examination, been given a psychiatric diagnosis, and/or had experienced hospitalisation, and 13% had paranoid ideation (Lester, 1993). Further, current and previous problems at work were associated with suicide.

In summary, there was evidence to suggest that police stress was related to suicide. There was conflicting evidence as to whether police officers committed suicide more often than the general population or people from other specific occupations. The inconsistencies detected in the literature may be a function of the different samples used in the various studies.

3.2.2 Physical Health

A number of studies on the consequences of police stress have investigated the physical health of police officers (Brown & Campbell, 1990; Cooper, Kirkcaldy & Brown, 1994; Ely & Mostardi, 1986; Fell et al., 1980; Hageman, 1982; Honig & Reiser, 1983; Kirkcaldy, 1993; Kirkcaldy, Cooper, Brown & Athanasou, 1994; Kreitner, Sova, Wood, Friedman & Reif, 1985; Norris et al., 1990; Norvell, Belles & Hills, 1988; Pendergrass & Ostrove, 1984; Quire & Blount, 1990; Williams et al., 1987; Young, 1994). Through an analysis of death certificates and records from community mental health centres and medical hospitals, police officers were demonstrated to be more prone to develop serious medical disorders than the majority of workers from 130 different occupations (Fell et al., 1980). Police officers died prematurely from stress-related diseases, such as those involving the cardiovascular system, at a higher rate than people from other

occupations. Additionally, they were hospitalised more often for these types of disorders. Other research indicated that police officers developed ulcers more often than civilian support workers (Pendergrass & Ostrove, 1984).

Several researchers have examined the risk of coronary heart disease in police officers (Ely & Mostardi, 1986; Kreitner et al., 1985; Pendergrass & Ostrove, 1984; Quire & Blount, 1990; Young, 1994). Research has shown that police stress was associated with an increased risk of coronary heart disease (Williams et al., 1987). Indeed, research indicated that police officers were diagnosed with heart disease more often than a comparison group of civilian support workers (Pendergrass & Ostrove, 1984). Further, research has demonstrated that police officers had elevated BP, with DBP being higher than that of the general United States male population (Ely & Mostardi, 1986) and higher than that of civilian support workers (Pendergrass & Ostrove, 1984). It has been reported that one third of a police sample evidenced clinically high BP (Norvell et al., 1988). Since elevated BP has been shown to be a coronary heart disease risk factor (Blanchard, 1990; Campbell, Bushby & Robertson, 1993; Farquhar, 1991; Fujii & Imataka, 1993; Gliksman, Lazarus, Wilson & Leeder, 1995; Jones, Greaves & Iliffe, 1992; Jorgensen & Houston, 1988; Kaushik, Mukhopadhyay, Sheik & Goel, 1991; Kreitler, Weissler, Kreitler & Brunner, 1991; Malcolm & Janisse, 1991; Meland, Laerum & Stensvold, 1994; Mills, Schneider & Dimsdale, 1989; Mitsibounas, Tsouna-Hadjis, Rotas & Sideris, 1992; Oldenburg, Owen, Parle & Gomel, 1995; Suarez & Williams, 1990; Wright, Carbonari & Voyles, 1992), such research implied that police officers were at risk of developing coronary heart disease.

Other evidence for the impact of police work on the health of police officers came from research that compared police officers granted stress disability pensions to officers still working (Honig & Reiser, 1983). Not surprisingly, police officers who retired on the grounds of a work-related stress condition had more physical illness and stress-related disorders compared with matched police officers still

engaged in police work. Hypertension, lower back pain and gastrointestinal disorders were the most commonly reported illnesses of these police officers.

A longitudinal study has demonstrated that the introduction of programmes, designed to address such issues, can have success, with coronary heart disease risk decreasing over time in one sample of police officers (Quire & Blount, 1990). Other research has investigated the effectiveness of fitness programmes in reducing the risk of heart disease in police officers (Norris et al., 1990; Williams et al., 1987; Young, 1994). The evidence suggested that with increased fitness, police officers' risk of heart disease decreased.

Differences between police officers who were smokers, nonsmokers and ex-smokers on measures of physical health, stress and job satisfaction have been documented (Kirkcaldy, Cooper, Brown & Athanasou, 1994). Results indicated that police officers who smoked reported the highest levels of stress and poorest physical health. Police officers who had never smoked reported the highest level of job satisfaction and psychological well-being, whereas the ex-smokers were least satisfied with their job and were highly psychologically distressed. The greatest group differences were demonstrated in relation to physical health. Smokers consumed more alcohol and exercised less than the other police officers. They also were absent from work more often than the other two groups. To summarise the findings, in addition to being a health risk in its own right, smoking was associated with other health problems, including an increase in physical symptoms such as shortness of breath, dizziness, and consuming more food and beverages.

Research has indicated that the impact of stress on the physical health of police officers occurs early in an officer's career (Hageman, 1982). Police officers in training and officers early in their careers were demonstrated to have depleted levels of vitamins C and B6 and zinc. Low levels of such nutrients have been reported to leave the human body susceptible to stress and illness (Mitchell & Bray, 1989).

In summary, there was evidence to suggest that police stress impacted upon the physical health of police officers. In particular, cardiovascular health has been shown to be at risk. Importantly, there was some evidence to suggest that such health risks for police officers could be reduced.

3.2.3 Quality of life

In addition to affecting the police officers' psychological and physical well being, evidence has suggested that the stress of police work also affected their quality of life. Two aspects of quality of life have been cited consistently in the literature: job satisfaction (Brown et al., 1996; Burke & Kirchmeyer, 1990; Cooper et al., 1994; Farkas, 1986; Kirkcaldy, 1993; Lester & Mink, 1979; Lester et al., 1981; Norvell et al., 1988) and family life (Burke, 1988a, 1993a; Doctor et al., 1994; Elliott, Bingham, Nielsen & Warner, 1986; Farkas, 1986; Jackson & Maslach, 1982; Lester & Mink, 1979; Macleod, 1995; Madamba, 1986; Stotland & Pendleton, 1989).

Job Satisfaction

Generally, research has demonstrated that as the level of work stress increased, police officers' satisfaction with their occupation decreased (Brown et al., 1996; Cooper et al., 1994; Kirkcaldy, 1993; Lester et al., 1981; Norvell et al., 1988; Sigler & Wilson, 1988). In addition to stress being negatively correlated with global job satisfaction, research has indicated that this negative relationship was particularly strong for satisfaction with the nature of police work, and satisfaction with interpersonal relationships at work (Norvell et al., 1988). In contrast, research also indicated that, despite relatively high levels of stress, police officers still reported high job satisfaction (Kirkcaldy, 1993). Further, police officers have been reported to be more satisfied with their jobs than clerical workers

(Lester & Mink, 1979), although other research has demonstrated that police officers reported below average levels of satisfaction with work (Lester et al., 1981).

The type of work in which police officers were engaged (Farkas, 1986) and the reason for joining the police force (Burke & Deszca, 1986; Burke & Kirchmeyer, 1990) have been demonstrated to be related to job satisfaction. Research on police officers engaged in undercover work has indicated that these officers experienced difficulty making transitions to other positions after an undercover assignment (Farkas, 1986). Indeed, 42% of undercover police officers experienced such difficulties. These adjustment difficulties impacted negatively on job satisfaction.

In relation to reasons for joining the police force, research has documented that those who joined to "earn a living" were the least satisfied with the occupation (Burke & Deszca, 1986; Burke & Kirchmeyer, 1990). These officers also reported greater intention to leave the police force than did people who joined for other reasons.

In summary, research clearly indicated that there was a negative correlation between perceived stress and job satisfaction. Little research has compared police officers' job satisfaction with people employed in other occupations. The results that have been reported were not consistent. Further, there was limited research indicating that, despite high levels of stress, police officers still reported high levels of job satisfaction.

Family Life

A number of researchers have examined the ways in which the stress of police work affected the family life of police officers (Burke, 1988a, 1993a; Crank & Caldero, 1991; Doctor et al., 1994; Elliott et al., 1986; Farkas, 1986; Jackson & Maslach, 1982; Kroes et al., 1974; Lester & Mink, 1979; Macleod, 1995; Maynard

& Maynard, 1982; Stotland & Pendleton, 1989). On a general level, 93% of police officers, compared to 47% of clerical workers, reported that work stress affected their lives outside work (Lester & Mink, 1979). Further, 27% of the variance reported in quality of family life was explained by burnout (Jackson & Maslach, 1982). Higher levels of emotional exhaustion and depersonalisation were most predictive of poor quality of family life. Research employing the Cornell Medical Index has indicated that physical symptoms, including fatigue and cardiovascular and respiratory difficulties, as well as psychological symptoms such as depression, anxiety, anger and tension, were negatively associated with family satisfaction (Stotland & Pendleton, 1989). Additionally, state and trait anxiety and excessive alcohol use were negatively correlated with quality of family life.

The demands of police work have been reported to leave police officers fatigued, preoccupied and emotionally exhausted when at home (Burke, 1993a). Specific aspects of the police occupation have been demonstrated to impact on family life. For example, the perception of danger was significantly related to relationship/marital problems (Farkas, 1986). Shift work (Burke, 1988a; Crank & Caldero, 1991; Doctor et al., 1994), transfers (Doctor et al., 1994), work environment characteristics, such as institutional goals, poor leadership and supervision, and the stressors of police work also were related to increased difficulties (Burke, 1988a; Kroes et al., 1974).

Investigations of undercover policing have demonstrated this type of work to be particularly difficult for families of police officers (Farkas, 1986; Macleod, 1995). Farkas (1986) reported that 41% of undercover police officers experienced adverse changes in relationships with their families and friends. One third of the sample indicated that their families and friends experienced stress as a consequence of their undercover work. An equal number of police officers reported a loss of contact with their families and friends. A number of police officers experienced relationship/marital problems before (11%), during (28%), and after (14%)

engaging in undercover work. The interpersonal difficulties experienced appeared to be related to the nature of covert assignments, including being away from family and friends and being unable to discuss the assignment with their spouses.

Police stress has been demonstrated to impact on the spouses of police officers (Jackson & Maslach, 1982; Maynard & Maynard, 1982). Wives of American police officers, who reported their husbands coming home from work angry, tense, anxious and tired, tended to report higher levels of emotional exhaustion (Jackson & Maslach, 1982). Further, the wives reported less satisfaction with their husbands' jobs. Additionally, for the police officers who were experiencing burnout, a more restricted social network was evident for both themselves and their partners.

In a study utilising questionnaires and interviews (Maynard & Maynard, 1982), nearly 55% of the wives who participated believed that the police organisation would prefer police officers to be single or divorced rather than married with a family. The wives reported that the family had to adapt to the police organisation and to plan their lives around the husbands' work context. Indeed, 74% of the wives indicated that their husbands' police careers took precedence over family life. Not surprisingly, the police department in which this study took place had a 70% divorce rate for police officers in their first 5 years in the department.

Research which investigated the relationship between marital satisfaction and stress indicated that high levels of stress experienced by police officers was not predictive of lower marital satisfaction (Elliott et al., 1986). This study showed that marital satisfaction among police officers and their partners was relatively unaffected by the occupational stress experienced by the officers. Further, research has indicated that length of time married was not associated with levels of stress experienced by police officers (Madamba, 1986).

In summary, research has established that police stress affected not only police officers themselves, but also their families and friends. Both general stress

and stress arising from specific aspects of police work were associated with decreased quality of life.

3.2.4 Summary

It was evident from the many studies reviewed that the stress arising from police work impacted on police officers. Police stress has been associated with anxiety and distress, burnout, PTSD, alcohol and drug use and suicide. The levels of psychological disturbance reported varied, with some levels severe enough to indicate a psychiatric disorder whereas other reports discussed levels of psychological symptomatology. Police stress also has been associated with physical health problems, particularly cardiovascular disease. Further, the stress arising from police work impacted on job satisfaction and family functioning. It is important to note that some studies investigating the consequences of police stress did not include means for the dependent variables measured (e.g., Cooper et al., 1994; Lester & Gallagher, 1980; Lester & Pitts, 1990; Sigler & Wilson, 1988; Stotland & Pendleton, 1989; Violanti & Aron, 1993), whereas others (e.g., Fusilier, Ganster & Mayes, 1987; Hart et al., 1995; Kirkcaldy, Brown & Cooper, 1994; Lester, 1982b; Pendergrass & Ostrove, 1984) reported mean scores but did not include any ranges for the scores or give any indication what the mean scores represented in terms of severity of impact. Consequently, it was not possible to describe or clarify the impact of stress on police officers from these studies.

3.3 Sources of police stress

A portion of the research conducted on police stress has examined the sources of this stress. It is evident from Table 1 that 21% of the research has examined this issue. Two main categories of stressors have been identified: those that were

related to the police organisation (organisational stressors) and those that were related to the actual work performed by police officers (operational stressors). It is to be noted that police occupational culture has been implicated in police stress (Brown & Campbell, 1994). However, the focus of the dissertation is on non-cultural factors, and the literature reviewed in this section reflects that orientation.

3.3.1 Organisational stressors

A number of sources of stress cited by police officers in surveys and interviews were related to the police organisation. Organisational stressors referred to those situations or events precipitated by police administration (Violanti & Aron, 1993), and include administrative policies, workloads, shift work and rates of pay. Organisational stressors have been cited as being stressful more frequently than operational stressors (Brandt, 1993; Brown & Campbell, 1990; Brown, et al., 1996; Crank & Caldero, 1991; Graf, 1986; Kirkcaldy, 1993; Martelli, Waters & Martelli, 1989; Violanti & Aron, 1993). The impact of organisational stressors on the level of psychological distress experienced by police officers was demonstrated in a study of American police officers (Violanti & Aron, 1993). Results indicated that organisational stressors, mediated by job satisfaction and organisational goal orientation, increased psychological distress 6.3 times more than operational stressors. The impact of organisational stressors on police officers was established when the high turnover rates of American police forces were compared to the low turnover rates of Danish police forces (DeLey, 1984). Lower turnover of police officers in Denmark was associated with a police organisation that was less hierarchical, more open, informal and consultative than the American system.

The Danish police force would appear to be the exception. Generally, the police organisation has been viewed as rigid, and as denying police officers individual expression and autonomy (Doctor et al., 1994). Two specific demands

of the police organisation, depersonalisation and authoritarianism, have been associated with police stress (Violanti & Marshall, 1983). Depersonalisation has been used to denote a sense of forced emotional estrangement (Harris, 1973). For example, it has been argued that police officers were required to objectify emotions when dealing with unpleasant work situations, such as being confronted with deceased persons, victims of crime and abused children. Depersonalisation was seen to increase stress because it created a conflict between objectified and seemingly real human emotion (Levine & Scotch, 1973; Moss, 1973). Authoritarianism has been identified as a demand that has been considered necessary by the police structure. Public perception of police has been clearly one of authority and force. Police officers often were seen as aggressive, tough, cynical and preoccupied with power (O'Brien, 1978). Authoritarian attitudes were considered to be stressful because they restricted the range of the police officer's coping repertoire in work situations.

Bruns and Shuman (1988) focused their attention on the authoritarian leadership style that has been postulated as being promoted by the para-military structure of the police organisation. Results indicated that whereas police managers perceived their organisational leadership styles to be authoritative, they wished their leadership style to be more participative. Indeed, participative leadership styles have been shown to produce positive outcomes for employees, in terms of job satisfaction and productivity (Nightingale, 1981; Tjosvald & Andrews, 1983). The role of bureaucratisation of policing, or the greater use of managerial controls, has been a source of stress for rank and file officers (Steinman, 1988). Bureaucratisation has resulted in police officers mistrusting those officers at senior management level. Police departments in which many officers reported feelings of alienation because rules and regulations were perceived as controlling rather than assisting, were less able to deliver effective and efficient policing services to the local community.

Problems at an organisational level have been demonstrated to be widespread. Research indicated that administrative policies, regulations and procedures were stressful to police officers (Crank & Caldero, 1991; Evans & Coman, 1993; Kroes et al., 1974; Lawrence, 1984; Storch & Panzarella, 1996), at least in part, because they were seen to undermine police function (Crank & Caldero, 1991). Lack of communication and consultation also were stressful (Brandt, 1993; Brown & Campbell, 1990; Brown et al., 1996). Senior personnel have been perceived as being unsupportive (Brandt, 1993; Brown & Campbell, 1990; Evans & Coman, 1993; Lawrence, 1984; Lester, 1982b) and as being poor supervisors (Evans & Coman, 1993). A lack of promotional opportunities were evident, and favouritism in relation to promotions has been demonstrated to be stressful (Crank & Caldero, 1991; Lester, 1982b). Stress was generated by staff shortages (Bartol et al., 1992; Brown & Campbell, 1990; Brown et al., 1996) and insufficient resources, including equipment (Brown & Campbell, 1990; Brown et al., 1996; Kroes et al., 1974). Heavy workload (Brown & Campbell, 1990; Brown et al., 1996; Crank & Caldero, 1991), deadlines and time pressure (Brown & Campbell, 1990), long hours (Brown & Campbell, 1990), role ambiguity (Brown & Campbell, 1990), lack of recognition for good work, inadequate retirement plans (Bartol et al., 1992), rates of pay (Kroes et al., 1974) and boredom (Brown & Campbell, 1990) have all been cited as sources of stress linked to the police organisation.

One aspect of police structure that consistently has been cited as a stressor was shift work (e.g., Brown & Campbell, 1990; Crank & Caldero, 1991; Kroes et al., 1974; O'Neill & Cushin, 1992). The impact of changing work shifts on family life contributed to friction between the police officer and their family, and led to increased stress (Crank & Caldero, 1991; Kroes et al., 1974; O'Neill & Cushin, 1992). Research has highlighted the negative effects shift work has on the sleeping patterns and eating habits of the police officer (Kroes et al., 1974). Although the reasons for continuing with rotating shifts have been questioned (Hurrell, 1986),

there was evidence to suggest that some rosters have a more positive impact on employees than others. For example, positive psychological and psychophysiological responses of police officers were evident when the rosters of two groups of American officers were changed from an 8 hour, 12 day shift cycle to a 12 hour, 8 day cycle (Peacock, Glube, Miller & Clune, 1983; Pierce & Dunham, 1992). Cardiovascular respiratory fitness, BP, sleep duration, sleep quality and subjective levels of alertness all improved in one study (Peacock et al., 1983), whereas self-reported stress and fatigue decreased in another study (Pierce & Dunham, 1992). The main advantage of the new system appeared to be the ability to have consistency in their sleep patterns. Work shifts that allowed the police officer to participate fully in family life and community activities resulted in the lowest levels of negative consequences in terms of physical and psychological adjustment (Pierce & Dunham, 1992). Thus, there was evidence to suggest that some of the negative aspects associated with shift work could be minimised by altering the shift work structure.

Research has established that there were many sources of stress that related to the police organisation. However, data suggested that police officers were stressed by organisational variables common to most occupational groups (Evans & Coman, 1993). It has been concluded that when comparing the reported exposure rates to organisational stressors, police officers were no different to employees of other organisations (Brown & Campbell, 1990, 1994). For example, work overload has been demonstrated to be a stressor for air-traffic controllers (Repetti, 1993), aircraft cabin attendants (Barnes, 1992), executives (Rogers, Li & Ellis, 1994), shrimp fishermen (Kline, Robbins & Thomas, 1989), nurses (Motowildo et al., 1986), mail sorters (Perrewe & Ganster, 1989), dentists (Cooper et al., 1978), teachers (Smith & Bourke, 1992), automation personnel (Andries, Bijleveld & Pot, 1991), computer operators (Schleifer & Shell, 1992), army storemen (Farrell, 1990),

construction site managers (Sutherland & Davidson, 1989) and public sector employees in general (Haines et al., 1996a, 1996b).

Role ambiguity has been reported as stressful for nurses (Jamal, 1990), salespersons (Sager, 1994), university faculty workers (Pretorius, 1994), men working in an financial institution (Widrich & Ortlepp, 1994), teachers (Byrne, 1994) and child care workers (Manlove, 1994). Time pressure and meeting deadlines were stressful for teachers (DeFrank & Stroup, 1989; Smith & Bourke, 1992), bus drivers (Evans, 1994), telephone operators (DiTecco, Cwitco, Arsenault & Andre, 1992), sewing machine operators (Brisson, Vezina & Vinet, 1992), automation personnel (Andries et al., 1991), car mechanics (Houben, Diederiks, Kant & Notermans, 1990) and assembly line workers (Lundberg et al., 1989). Long working hours were stressful for bus drivers (Duffy & McGoldrick, 1990), prison officers (Rutter & Fielding, 1988) and blue and white collar workers (Uehata, 1991).

Lack of consultation and communication have been reported as stressors by bus drivers (Duffy & McGoldrick, 1990; Evans, 1994), prison officers (Rutter & Fielding, 1988), faculty members of a university (Pretorius, 1994) and general public sector employees (Haines et al., 1996a). Administrative policies were stressful for purchasing professionals (Tadepalli, 1991). Staff shortages have been reported by prison officers (Rutter & Fielding, 1988) and occupational therapists (Sweeney, Nicholls & Kline, 1991) as contributing to stress.

Working with inadequate resources was a stressor for teachers (DeFrank & Stroup, 1989), nurses (Jamal, 1990) and occupational therapists (Sweeney et al., 1991). Lack of equipment was stressful for science teachers (Okebukola & Jegede, 1992) and equipment breakdowns were stressful for stock brokers (Burke, 1990).

Shift work has been demonstrated to be stressful for nurses (Jamal & Baba, 1992; Kandolin, 1993), prison officers (Härenstam et al., 1987), firefighters (Paley & Tepas, 1994) and bus drivers (Duffy & McGoldrick, 1990; Evans,

1994). Inadequate pay has been cited as a stressor by prison officers (Rutter & Fielding, 1988), civil servants (Bogg & Cooper, 1995) and army storemen (Farrell, 1990).

Poor supervision has been reported as stressful by school psychologists (Huebner, 1992), teachers (Bhagat & Allie, 1989), occupational therapists (Sweeney et al., 1991) and social workers (Ramanathan, 1990). Lack of support from supervisors was stressful for nurses (Motowildo et al., 1986), bus drivers (Duffy & McGoldrick, 1990), car mechanics (Houben et al., 1990) and general public sector employees (Haines et al., 1996a, 1996b).

Therefore, whereas police officers reported many sources of stress associated with the organisation in which they worked, these stressors were experienced by employees from many other occupations.

Importantly, it has been argued that the stressors associated with the organisation in which police officers work were not insurmountable. It already has been detailed how changing the shift work roster had beneficial effects for police officers (Peacock et al., 1983; Pierce & Dunham, 1992). Further, it may be that changes in organisational structure and involvement in decision making may alleviate some of the stress experienced by police officers, as has been suggested for public sector employees in general and including police (Haines et al., 1996a, 1996b). It has been proposed that administrators consult police officers on relevant matters that concern them on a daily basis (Steinman, 1988). It also has been suggested that police organisations discard unnecessary routines, such as standing to attention for inspection, as these were seen as unnecessary controls over job performance. Violanti and Aron (1993) also emphasised the possibility of aspects of the police organisation being changed to alleviate the impact they have on the psychological distress experienced by officers, although they did not specify what changes could occur to alleviate stress.

3.3.2 Operational stressors

A number of operational stressors have been identified in research of police stress. Operational stressors have been described as duty-related and referred to tasks arising from the work police officers performed (Evans & Coman, 1993). A major source of operational stress was the judiciary system (Bartol et al., 1992; Crank & Caldero, 1991; Evans & Coman, 1993; Kroes et al., 1974; Lawrence, 1984; Lester, 1982b; McLaren, 1990; Sewell, 1983; Storch & Panzarella, 1996). The stress associated with the judiciary system has been seen to be multifaceted. Stress has been demonstrated to arise from a frustration with the criminal process and court procedures (Bartol et al., 1992; Lawrence, 1984). American police officers have reported the perception of court leniency as being stressful (Bartol et al., 1992; Crank & Caldero, 1991; Kroes et al., 1974; Lawrence, 1984). Officers have indicated feelings of frustration when prosecutors made deals with defendants (Bartol et al., 1992), and they generally perceived the courts to be unsupportive (Lester, 1982b). Further, police officers have noted a perceived lack of consideration given to occupational demands when scheduling court appearances (Kroes et al., 1974). Moderate to high levels of stress also arise from the necessity of police officers to appear as witnesses in courts of law (Kroes et al., 1974; McLaren, 1990; Sewell, 1983; Storch & Panzarella, 1996). It has been demonstrated that attendance as a witness in a court of law was stressful due to lawyer confrontation (Storch & Panzarella, 1996), as the police officer was perceived to be discredited on both a professional and personal level (Kroes, 1976; McLaren, 1990).

Research has identified that dealing with the public was stressful for police officers (Crank & Caldero, 1991; Kroes et al., 1974; Lawrence, 1984; Lester, 1982b). Community relations were seen as stressful because the public held negative stereotypes of police officers and because the police contact with the public

was often negative (Crank & Caldero, 1991). Further, police officers considered the public generally to be apathetic in assisting them (Kroes et al., 1974).

Physical danger has been cited as a source of stress (Crank & Caldero, 1991; Evans & Coman, 1993; Farkas, 1986; Follette et al., 1994; Jermier et al., 1989; Martin et al., 1986; Sewell, 1983; Stratton et al., 1984) and was considered to be a unique domain of occupational experience for police officers (Jermier et al., 1989). It has been concluded that police work was highly stressful because it was one of the few occupations where an employee was expected to engage in situations that threatened their physical well-being (Territo & Vetter, 1981). Although this danger has been linked to physical injury, it also has been reported to infuse an otherwise boring, mundane job with excitement and exhilaration (Jermier et al., 1989). The stress arising from physical danger, particularly from involvement in shootings, has been documented to be related to the development of PTSD in police officers (Follette et al., 1994; Martin et al., 1986; Stratton et al., 1984).

However, not all researchers agreed that physical danger constituted a source of stress for police officers. Lawrence (1984, p. 260) noted that the danger factor in police work "is not assumed to be a major factor in police stress...not in this study...nor in most other studies of police stress". It was argued that although police officers were under the threat of constant danger, it was a part of their job for which they were most prepared and best equipped. Over a decade ago, Malloy and Mays (1984) concluded in their literature review that it was anecdotal literature which suggested that the danger factor was a major source of police stress, and that threats of physical harm or death failed to emerge as stressors in empirical studies. However, a review of the more recent literature suggested that physical danger was indeed a source of stress, and at times exhilaration and excitement, for police officers.

Other operational stressors have been identified in the literature. These included attending the scene of sudden deaths (Brown & Campbell, 1990),

including traffic accidents (Hermann, 1989; Larsson et al., 1987; McLaren, 1990), homicides (Sewell, 1994) and disasters (Duckworth, 1991; Thompson & Solomon, 1991); delivering death notifications to relatives of the deceased (Brown & Campbell, 1990; McLaren, 1990); facing unpredictable situations (Evans & Coman, 1993); arresting violent persons (Brown & Campbell, 1990; Larsson et al., 1987); dealing with victims of abuse and violence (Brown & Campbell, 1990; Follette et al., 1994; Larsson et al., 1987; Martin et al., 1986); and having to intervene in crises (Lester, 1982b). However, the literature did not explain why these operational tasks were stressful for police officers. It has been reported by police officers that attending the scenes of serious car accidents was stressful (McLaren, 1990), one reason for this being the officers often could only offer verbal support and reassurance to the injured victims. This situation has been reported to result in feelings of helplessness (Hermann, 1989).

Emotional danger has been postulated to be one possible underlying factor accounting for the stress experienced in relation to operational stressors. Jermier et al. (1989, p. 16) defined emotional danger as "exposure to human tragedy, pain, misery and suffering". Although some researchers partially tapped into this phenomenon with their investigations of PTSD (Follette et al., 1994; Martin et al., 1986), and Violanti and Marshall (1983) approached the concept in their discussions of depersonalisation, the emotional costs of police work have largely gone unstudied. The research to date has been primarily quantitative (e.g., Brown & Campbell, 1990; Evans & Coman, 1993), rather than qualitative. Therefore, whereas there was some indication in the literature of the types of situations that were stressful for police officers, little has been documented about why these situations were stressful in general, or about the specific stressful components of these situations. Considering the increasing recognition of the need for police organisations to take responsibility for the physical and psychological well-being of their officers (Machell, 1993; Sewell, 1994), including providing CISD procedures

(Mitchell & Everly, 1995; Smith & de Chesnay, 1994), it would appear important to clearly establish the effects of particular stressful operational tasks on police officers.

3.3.3 Summary

A significant amount of research investigating police stress has documented the sources of this stress. Sources of police stress have been divided into two main categories: organisational stressors and operational stressors. It was evident that organisational stressors were cited as stressful more often in the literature. This was not to suggest, however, that operational aspects of police work were not stressful. Indeed, PTSD symptomatology has been linked to operational stress rather than organisational stress (Follette et al., 1994; Martin et al., 1986; Stratton et al., 1984). Thus, both the organisation in which police officers work and the actual work they performed were sources of stress. Although there was some indication in the literature as to why aspects of the police organisation were stressful, there were few details indicating why particular operational tasks were stressful for police officers. This has significant implications for the police department in terms of implementing interventions such as CISD procedures.

3.4 Factors influencing police stress

It has been clearly established that police officers experience stress, and that this stress has resulted, at least in part, from the nature of the organisation in which they work and from the type of work they perform. Some of the literature on police stress has documented factors which have influenced the level of stress and the type of stress particular police officers have experienced. Three categories of

factors have been identified: sex, the related variables of age, rank and years of service, and personality characteristics.

3.4.1 Sex of police officers

An inspection of Table 1 indicated that many studies of police stress have used male participants exclusively (e.g., Arcuri & Lester, 1990; Beutler et al., 1988; Ely & Mostardi, 1986; Hills & Norvell, 1991; Kreitner et al., 1985; Kroes et al., 1974; Lawrence, 1984; Lester & Gallagher, 1980; Lester & Mink, 1979; Madamba, 1986; Norris et al., 1990; Norvell et al, 1988; Quire & Blount, 1990; Stradling et al., 1993; White et al., 1981; Williams et al., 1987; Young, 1994). The focus on male police officers, particularly in the earlier studies, tended to reflect the recruitment practises of police forces. For example, opposition to females being allowed to work as police officers saw them entering police departments at a slow and gradual rate (Brown & Campbell, 1994). Additionally, female police officers remain a minority in police forces (Brown & Fielding, 1993; Evans et al., 1993). To date, females constitute approximately 10% of British (Brown & Campbell, 1994) and Tasmanian (Police Commissioner J. Johnson, personal communication, November 22, 1996) police officers. Sampling of police officers for studies have often yielded very small female samples (e.g., Cooper et al., 1994; Doctor et al., 1994; Ely & Mostardi, 1986; Fusilier et al., 1991; Haines et al., 1996a; Kirkcaldy, Shephard & Cooper, 1993; Larsson et al., 1988; Perrott & Taylor, 1994; Sigler & Wilson, 1988; White, Lawrence, Biggerstaff & Grubb, 1985), which has led to females being excluded from some research (e.g., Ely & Mostardi, 1986; Quire & Blount, 1990; Stradling et al., 1993). Thus, the predominance of male participants in police stress research is explained by historical and sampling reasons.

More recent research appeared to be including both male and female police officers (e.g., Alexander & Walker, 1994; Brown & Campbell, 1990; Brown & Fielding, 1993; Burke, 1987a, 1989a, 1993a; Cooper et al., 1994; Doctor et al., 1994; Evans & Coman, 1993; Follette et al., 1994; Fusilier et al., 1987; Janik & Kravitz, 1994; Kirkcaldy, 1993; Kirkcaldy et al., 1993; Larsson et al., 1988; Martin et al., 1986; McCammon et al., 1988; Perrott & Taylor, 1994; Pierce & Dunham, 1992; Sigler & Wilson, 1988; Smith & de Chesnay, 1994; Stearns & Moore, 1990, 1993; Thompson & Solomon, 1991). Some researchers (e.g., Brown & Campbell, 1990; Cooper et al., 1994; Evans & Coman, 1993; Evans et al., 1993; Fusilier et al., 1987; Kirkcaldy, 1993; Kirkcaldy et al., 1993; Perrott & Taylor, 1994; Pierce & Dunham, 1992; White et al., 1985) have combined the results of male and female police officers and analysed the responses as one group, whereas others (e.g., Alexander & Walker, 1994; Brown & Fielding, 1993; Janik & Kravitz, 1994; Martin et al., 1986; Stearns & Moore, 1990) have compared the results of male police officers to female police officers.

Research which has compared male police officers to females has demonstrated differences between the two groups on several aspects of the stress process. Differences have been established between males and females in their experience of psychopathology/symptomatology. Female police officers reported significantly more stress symptoms than males, particularly physiologically based symptoms such as headaches, nausea and muscle tension (Pendergrass & Ostrove, 1984). An examination of burnout symptoms demonstrated higher levels of emotional exhaustion for females compared to males (Gaines & Jermier, 1983; Stearns & Moore, 1990).

In relation to the experience of sources of stress, research has indicated that female police officers were more likely to report a large number of stressors overall, whereas males were more likely to report no stressors (Martin et al., 1986). Research on British police officers has established that whereas male and

female police officers experienced similar organisational stressors, the groups were exposed to different operational stressors (Brown & Fielding, 1993). Male police officers experienced more violent confrontations, whereas females were exposed to more victims of crime. Women also were demonstrated to suffer from additional stressors related to their sex, such as sex discrimination and prejudice. Further, sexual harassment has been reported by the majority of British female police officers (see Brown & Campbell, 1994). Other research has indicated that female police officers reported significantly less physical danger than males, suggesting that they were exposed to different situations to male police officers (Jermier et al., 1983). Research also showed that female police officers reported the frequent exposure to tragedy and danger as more stressful than did males (Bartol et al., 1992). Females in this study also reported higher stress relating to the responsibility for other people's lives and safety compared to male police officers. Males were more stressed by perceived relationships with colleagues, the size of their department and lack of training.

In summary, a number of differences have been noted in research which compared the antecedents and consequences of police stress in male and female police officers. It was evident that sex was an important variable in police stress research. However, a number of researchers have not indicated the sex of the participants in their research (e.g., Alexander, 1993; Alexander & Wells, 1991; DeLey, 1984; Duckworth, 1991; Elliott et al., 1986; Graf, 1986; Hageman, 1982; Holaday, Warren-Miller, Smith & Yost, 1995; Kaufmann & Beehr, 1989; Kirkcaldy, Brown & Cooper, 1994; Loo, 1986; Peacock et al., 1983; Steinman, 1988; Stratton et al., 1984; Violanti & Aron, 1993; Violanti & Marshall, 1983; Violanti et al., 1983, 1985). Although it may be assumed that the majority of these officers were male, sex should be a fundamental aspect of the description of participants. Therefore, researchers should have noted the sex of participants in the relevant section of their reports.

It has been argued that detailing the sex of the sample investigated also was important because there have been concerns about the ability to generalise the results of research on male police officers to female police officers. Baruch, Biener and Barnett (1987) proposed two concerns. One criticism centred on the fact that the results of research on men did not always apply to women. For example, their review of relevant literature indicated that although occupational stress has been associated with increased coronary heart disease and mortality rates in males, data on women showed employed women to be advantaged over nonemployed women. A second criticism centred on the notion that the factors important in the stress process of women were neglected. For example, research has not classified the roles of wife and mother as stressful because they are not roles performed by males (Baruch et al., 1987). Consequently, researchers should always indicate the sex of the participants in their research and data from males and females should be analysed separately.

In summary, previous research on police stress has been conducted predominantly on male police officers, with some researchers not specifying the sex of their participants, and others combining the results of males and females. It has been contended that the results of research on males should not routinely be applied to females. This argument has been supported by research demonstrating differences in various aspects of the stress process for male and female police officers.

3.4.2 Age, rank and years of service

The age of a police officer, their rank and length of service in the police force have been considered related variables (Janik & Kravitz, 1994; Lester, 1993; Mayes, Barton & Ganster, 1991; Sigler & Wilson, 1988; Stradling et al., 1993) that have been demonstrated to affect the level and type of stress experienced.

Research has indicated that these variables were related to the psychopathology/symptomatology experienced by police officers. For example, older patrolmen reported more perceived stress and lower job satisfaction than younger patrolmen (Lester et al., 1981). There was a tendency for police officers with advanced burnout to be older, of a higher rank (Burke & Deszca, 1986) and to have been in the police force longer (Burke, 1987a; Burke & Deszca, 1986). Further, experienced police officers reported significantly higher levels of emotional exhaustion and depersonalisation than police recruits (Stearns & Moore, 1990). As years of service in the police force increased, police officers' vulnerability to alcohol also increased, and they reported higher levels of somatic symptoms and anxiety (Beutler et al., 1988). One study, investigating burnout in 828 Canadian police officers, demonstrated that officers of lower rank reported more depersonalisation than those of higher rank (Burke, 1993a). No explanation was given, however, for this particular result.

One study examined the quantity of stress symptoms reported by three groups of American police officers: those who had less than 3 years experience in the police force, those who had 3 to 8 years experience and those who had 8 or more years of experience (White et al., 1981). Results indicated that substantial numbers of police officers, with less than 3 years experience, reported marked changes in behaviour, increased anxiety and irritability, difficulties in their personal life and consumption of excessive amounts of alcohol. Those officers with 3 to 8 years experience reported marked changes in their behaviour, including becoming argumentative. They noted difficulties in their personal life and in their sexual relationships. They also indicated feeling persecuted and disinterested in their work. Furthermore, the officers reported increased anxiety, depression and irritability. Police officers with 8 or more years experience also reported marked changes in their behaviour, including becoming more argumentative. They experienced problems in their personal life, and indicated increased anxiety,

depression and irritability. It was evident from this research that police officers with varying lengths of service in the police force all experienced stress symptoms. It was police officers with 3 to 8 years of experience who reported the most stress symptoms.

Other research indicated that it was police officers with 6 to 15 years of experience in the police force who reported the most stress (Burke, 1989a). In this study, five groups of police officers were used: those who had been in the police force less than 1 year; those with 1 to 5 years experience; those with 6 to 15 years experience; those with 16 to 25 years experience; and those with over 25 years of experience. Results demonstrated that those who had been police officers for 6 to 15 years reported the highest levels of stress and burnout. They perceived the greatest role conflict and ambiguity, the most negative work setting and the greatest work alienation. These officers also reported the greatest work-family conflict and the lowest job satisfaction. In general, psychosomatic symptoms increased as length of service increased.

Research indicated that Canadian police officers who had been in the police force for at least 15 years, and whose career had plateaued, were more stressed than police officers whose careers were still advancing (Burke, 1989b). Police officers, whose careers had plateaued, reported higher stress and greater intention to leave the police force. Further, they perceived a more negative work setting, greater work alienation and a lack of participation in decision making. These police officers also reported more work-family conflict and lower job satisfaction than police officers whose careers had not plateaued.

Fagan and Ayers (1982) investigated the stages of development of police officers. Results indicated that around 30 years of age, police officers experienced a crisis. This crisis generally involved the police administration, through, for example, disciplinary procedures or failed promotions. During the forties, those police officers who gained promotion looked forward to an advancing career,

whereas those who did not get promoted looked forward to retirement. This latter group of police officers developed more negative attitudes about their work and about the police organisation.

The physical health of police officers also varied with age (Burke, 1989a; Williams et al., 1987; Young, 1994). This research established that risk factors for coronary heart disease escalated with age. For example, research indicated that regular exercise decreased with age, and BP and heart attacks increased with age (Burke, 1989a). Weight, percentage of body fat, SBP, DBP, total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, cholesterol/high-density lipoprotein cholesterol ratio and triglyceride all were positively associated with age (Quire & Blount, 1990; Williams et al., 1987; Young, 1994). Risk behaviours such as Type A behaviour, cigarette use, and the number of cigarettes smoked per day also increased with age (Young, 1994). Thus, the risk factors for coronary heart disease were more evident as police officers aged. However, one study demonstrated that age and health symptoms were negatively correlated, indicating that ageing was associated with better health (Mayes et al., 1991). The actual role age played in this relationship, however, was not clear. The researchers emphasised the need to further investigate age as a moderator on health.

In summary, research has indicated that the levels of psychopathology/ symptomatology experienced, and the effects of police stress on the health of police officers varied, to an extent, as a function of the age of the police officer, the rank held, and the years of service in the police force. Other research indicated that the sources of stress experienced also were influenced by these variables (Brown & Campbell, 1990; Brown et al., 1996; Mayes et al., 1991; White et al., 1985). For example, research indicated that as one aged, role ambiguity and underutilisation of skills became more stressful (Mayes et al., 1991). White et al. (1985) demonstrated that 26 to 30 year old police officers reported significantly higher

stress as a result of physical/psychological threat than police officers over 40 years of age. Police officers aged 31-39 years reported significantly more stress resulting from administration than those aged 26-30 years and those over 40 years.

As noted, length of service was related to the sources of stress experienced (White et al., 1985). Police officers who had been in the police force for 16 or more years reported significantly more stress due to evaluation systems, including promotions, than police officers with 15 or less years experience. Whereas no explanation was offered for this result, it may be a consequence of career plateau (Burke, 1989b) or the developmental stages as outlined by Fagan and Ayers (1982).

As previously indicated, rank also was associated with the types of stressors experienced (Brown & Campbell, 1990; Brown et al., 1996). Research demonstrated that sergeants were exposed to more stressors than all other ranks (Brown & Campbell, 1990). Further, this research showed that sergeants were stressed by management and supervision difficulties, isolation and a lack of consultation. Constables were stressed by time pressure and deadlines, long working hours and working with civilians. Senior managers were stressed by criticism from the media. Other research (Brown et al., 1996) indicated that superintendents were more likely than chief superintendents to report stress arising from unclear promotional prospects, underpromotion and the absence of any potential career advancement.

In summary, the related variables of age, rank and length of service have been related to the antecedents and consequences of stress experienced by police officers.

3.4.3 Personality

Evidence has suggested that personality characteristics of police officers were related to the level and type of stress experienced (Burke, 1988b; Cooper et al., 1994; Ely & Mostardi, 1986; Evans & Coman, 1993; Fusilier et al., 1987; Kirkcaldy, 1993; Lawrence, 1984; Lester & Pitts, 1990; Lester, Butler, Dalley, Lewis & Swanton, 1982; Thompson & Solomon, 1991). The Type A behaviour pattern has been the focus of several studies. Researchers using the Occupational Stress Indicator have demonstrated Type A behaviour to be positively correlated with the experience of physical and psychological ill-health (Cooper et al., 1994; Kirkcaldy, 1993). Further, this dimension of personality was associated with higher levels of stress (Burke, 1988b; Evans & Coman, 1993), burnout and work-family conflict (Burke, 1988b). Indeed, the Type A behaviour pattern has been related to measures of psychological distress (Byrne & Reinhart, 1990) and risk factors for coronary heart disease in other Australian workers (Byrne & Reinhart, 1994).

Locus of control was another personality dimension that has received attention in the police stress literature (Brown et al., 1996; Cooper et al., 1994; Evans & Coman, 1993; Fusilier et al., 1987; Lester & Pitts, 1990; Lester et al., 1982; McLaren, 1990). Research has indicated that a belief in an external locus of control was positively associated with levels of perceived stress (Cooper et al., 1994; Evans & Coman, 1993; Fusilier et al., 1987; McLaren, 1990), the Type A behaviour pattern (Cooper et al., 1994) and psychological (Brown et al., 1996; Cooper et al., 1994; Lester & Pitts, 1994) and physical ill-health (Brown et al., 1996; Cooper et al., 1994). Further, it was shown to be related to lower reports of job satisfaction (Brown et al., 1996; Kirkcaldy, 1993; Lester et al., 1982).

Other research has examined the role of personality in the police stress process. For example, Thompson and Solomon (1991) investigated the

relationship between personality, as measured by the Eysenck Personality Questionnaire, and psychopathology, indexed by the GHQ. Their sample of British body handlers evidenced the protective function of extraversion. Further, neuroticism was positively correlated with scores on the GHQ and the Impact of Event Scale, indicating that this aspect of personality was related to the experience of psychological distress.

Research investigating stress in 104 Texan police officers demonstrated, through the use of multiple regression, that four personality factors accounted for most of the reported stress (Lawrence, 1984). The factors, as measured by the Minnesota Multiphasic Personality Inventory, indicated that police officers who were tense, expedient (disregarded rules), threat-sensitive and suspicious evidenced the most stress. This research also indicated that personality factors were related to the sources of stress. Police officers who were suspicious, expedient and threat-sensitive were stressed most by court appearances and judicial decisions. Those who were compulsive, outgoing, but upset easily, cited equipment failure as most stressful. Police officers who were assertive, aggressive and practical reported administrative procedures as stressful.

In summary, there was evidence to suggest that the personality of police officers was related to the level of psychopathology/symptomatology reported. Further, there was limited evidence to suggest that personality was differentially related to the sources of that stress.

3.4.4 Summary

Research has clearly demonstrated that police officers' sex, age, rank and length of service, as well as personality characteristics, affected the level of psychopathology/symptomatology experienced, and the frequency and intensity of coronary heart disease risk factors reported. Further, these variables were related

to the sources of stress experienced by police officers. Due to the relatively small proportion of police officers who were females, it was evident that their data should not routinely be analysed with male data. Research specifically aimed at recruiting and studying female police officers appeared necessary to overcome sampling difficulties. To control for the effects of age, rank and years of service, it may be necessary to employ a relatively homogenous group of police officers for research. It also would be appropriate to analyse the data for different ages, ranks, and varying years of service separately.

3.5 Evaluation of police stress research

There has been an abundance of research conducted on police stress, including its antecedents and consequences. If the results of this research into the psychological sequelae of police work were taken into account in matters of policy and planning (Smith & de Chesnay, 1994), then those involved must have confidence in these results. It appeared, however, that this research has not been evaluated methodologically, although Brown and Campbell (1994) concluded that the majority of published literature detailing police stress did not meet the methodological requirements of academic conventions. Similarly, Hart et al. (1995) contended that police stress research has been plagued by the inappropriate use of measures, the failure to include comparison groups, and the lack of a theoretical framework. Although research on stress has been criticised for being based predominantly on self-report data (Bruning & Frew, 1987; Burke, 1987c; Fried et al., 1984), insufficient attention has been given to the ways in which police stress research has been conducted. Given that the ways in which occupational stress has been investigated bears heavily on how much of the stress process is understood (Brief & Atieh, 1987), it is important to evaluate the ways in which police stress has been investigated. In Table 1, the listed research has been

scrutinised as to the comparison groups used, the dependent variables measured, the control measurements taken and the statistical analyses conducted. Given that most of the research conducted has employed inferential statistics, as indicated in Table 1, this factor was not considered further.

3.5.1 Comparative studies

It has been established that police officers have experienced a degree of stress associated with the operational tasks they performed and the organisation in which they worked. It has been proposed that a reliable way of demonstrating the existence of occupational stress was to compare the prevalence of psychopathology and symptomatology across different occupations (Payne & Firth-Cozens, 1987). This was particularly important given that police work has been postulated by some to be a highly stressful occupation (e.g., Alkus & Padesky, 1983; Ely & Mostardi, 1986; Kroes et al., 1974; Lester, 1982b; Martin et al., 1986; Pelletier, 1984; Sigler & Wilson, 1988; Stradling et al., 1993; Territo & Vetter, 1981; White et al., 1981). In order to establish if police work was highly stressful, research comparing police officers to members of other occupations must be viewed as essential. From Table 1 it is evident that some police stress researchers have indeed included comparison groups in their research. Such research constitutes 45% of the research included in Table 1. Of these studies, 64% employed other police samples, 29% utilised nonpolice samples, and 22% used normative data. When assessing the degree of use of comparison groups across all studies included in Table 1, however, just 13% of researchers have used comparison groups consisting of individuals not engaged in police work and 10% have used normative data.

As noted, the majority of studies have compared police samples to other police samples (Alexander & Wells, 1991; Fagan & Ayers, 1982; Fain & McCormick, 1988; Jermier et al., 1989; Kaufmann & Beehr, 1989; Kreitner et al.,

1988; Lester, 1982b; Lester et al., 1981; Norris et al., 1990; Peacock et al., 1983; Quire & Blount, 1990; Stearns & Moore, 1990; Steinman, 1988; Stotland & Pendleton, 1989). Such an approach does not allow the issue of stress in the police occupation to be explored relative to other occupations. Some studies have employed other occupational groups in police stress research. Researchers have used clerical workers (Ely & Mostardi, 1986; Gaines & Jermier, 1983; Jermier et al., 1989; Lester & Mink, 1979; Stearns & Moore, 1990), store managers (Lester & Gallagher, 1980), workshop attendants (Holaday et al., 1995), medical personnel (Holaday et al., 1995; McCammon et al., 1988; Tang & Lau, 1996), firefighters (Fusilier et al., 1987; Holaday et al., 1995), mental health professionals (Follette et al., 1994), teachers (Hart et al., 1995; Holaday et al., 1995; Sigler & Wilson, 1988; Tang & Lau, 1996) and tertiary students (Hart et al., 1995) as comparison groups for police officers.

Research has indicated that police officers were more stressed than members of other occupations (Ely & Mostardi, 1986; Fell et al., 1980; Follette et al., 1994; Lester & Mink, 1979; McCammon et al., 1988; Pendergrass & Ostrove, 1984; Sigler & Wilson, 1988; Stearns & Moore, 1990) and the normal population (Kirkcaldy, 1993; Lester et al., 1981; Norvell et al., 1988; Stearns & Moore, 1990; Thompson & Solomon, 1991). For example, police officers have been demonstrated to have significantly higher levels of burnout than clerical workers (Stearns & Moore, 1990) and mental health professionals (Follette et al., 1994), and significantly higher levels of perceived stress than teachers (Sigler & Wilson, 1988). Further, research indicated that police officers reported significantly more trauma and PTSD symptoms than mental health workers (Follette et al., 1994) and hospital workers (McCammon et al., 1988). Police officers have been shown to have higher DBP and adrenalin levels compared to clerical workers (Ely & Mostardi, 1986). The police officers in this sample also evidenced more life change, as measured by the Holmes-Rahe Schedule of Recent Life Events.

When examining normative data, police officers have been demonstrated to report significantly higher levels of psychological distress (Hills & Norvell, 1991; Thompson & Solomon, 1991), burnout (Stearns & Moore, 1990), alcohol consumption (Pendergrass & Ostrove, 1986), intrusion of thoughts following work at a disaster site (Thompson & Solomon, 1991) and greater incidences of stress-related diseases (Fell et al., 1980; Pendergrass & Ostrove, 1984). There was some evidence to suggest that police officers committed suicide more often than the normative population (Fell et al., 1980). As noted previously, however, this research did not indicate if the observed frequencies were greater than those expected by chance (Malloy & Mays, 1984). Further, police officers were stressed more by organisational structure and climate, relationships between work and home (Kirkcaldy, 1993) and relationships with their colleagues (Norvell et al., 1988) compared to normative data. Police officers were less satisfied with their jobs (Lester et al., 1981), their supervisors (Lester et al., 1981) and their rates of pay (Lester et al., 1981; Norvell et al., 1988) than the normative population. On the basis of such results, it has been concluded that police work was a highly stressful occupation, in part because of the operational tasks performed.

Some research has suggested that police officers experienced less stress in comparison with members of other occupational groups (Hart et al., 1995; Lester & Gallagher, 1980; Lester & Mink, 1979) and normative data (Brown & Campbell, 1990; Hart et al., 1995; Josephson & Reiser, 1990; Kirkcaldy, 1993). For example, Australian police officers have reported significantly higher levels of well-being and lower levels of psychological distress compared to teachers and tertiary students (Hart et al., 1995). It has been shown that American police officers felt relaxed more often and tense less often than department store managers (Lester & Gallagher, 1980). Other American police officers evidenced significantly higher levels of job satisfaction compared to clerical workers (Lester & Mink, 1979). Further, Chinese police officers experienced significantly less gender role stress

compared to teachers and nurses and higher levels of personal accomplishment than nurses (Tang & Lau, 1996).

Compared to normative data, police officers have indicated better psychological health (Kirkcaldy, 1993) and lower levels of psychological distress (Hart et al., 1995). Suicide rates have been shown to be lower for American police officers compared to the normative data at a county, state and national level (Josephson & Reiser, 1990). Further, research demonstrated that police officers were less likely to have a long standing illness or to have been in hospital compared to British normative data (Brown & Campbell, 1990). However, this research highlighted the difficulties in using normative data, mainly because samples of police officers were usually male dominated and had truncated age distributions. It has been suggested that it was anecdotal evidence which demonstrated police work to be a relatively stressful occupation (Malloy & Mays, 1984). Thus, when empirical evidence was available, as detailed above, police work appeared not to be more stressful than other occupations, or the normative population.

Some research has demonstrated that police officers experienced stress to the same extent as members of other occupations (Follette et al., 1994; Gaines & Jermier, 1983; Lester & Gallagher, 1980; Pendergrass & Ostrove, 1984) and obtained scores comparable with normative data (Fell et al., 1980; Kirkcaldy, 1993; Norvell et al., 1988; Perrott & Taylor, 1994). Research indicated that police officers reported the same intensity and frequency of emotional exhaustion as clerical workers (Gaines & Jermier, 1983), the same level of perceived stress as mental health professionals (Follette et al., 1994) and clerical workers (Pendergrass & Ostrove, 1984), and the same physical consequences of stress as clerical workers (Pendergrass & Ostrove, 1984) and department store managers (Lester & Gallagher, 1980). Compared with normative data, police officers reported the same levels of physical symptoms (Kirkcaldy, 1993; Norvell et al., 1988) and perceived stress (Norvell et al., 1988; Perrott & Taylor, 1994), but lower rates of

admission to psychiatric institutions (Fell et al., 1980). It has been contended that just as police officers experienced occupational stress, so too did people employed in other occupations (Terry, 1981).

A recent study detailed the stress and trauma symptoms reported by police officers, firefighters, paramedics and road construction workers, who had worked at the scene of a freeway collapse in the United States of America (Marmar et al., 1996). Results indicated that the police officers reported significantly higher exposure to stressors at the disaster scene compared to the road construction workers. After statistically controlling for exposure levels, paramedics reported higher levels of dissociation during the trauma and more social adjustment problems after the trauma than the police officers. Further, both the paramedics and the road construction workers reported more general stress symptoms and PTSD symptoms than the police officers. However, the police officers were absent from work following the event more often than the other workers. This study was unique because the researchers were able to measure different workers' responses to the same incident. Mixed results were demonstrated, but generally indicated that the police officers were not more stressed than the other workers.

In summary, a proportion of police stress researchers have incorporated comparison groups into their research, or compared police officers' responses with normative data. Some research has demonstrated police officers to be more stressed than members of other occupations and normative data, other research has evidenced equal levels of stress, and yet other studies have demonstrated police officers to be less stressed. Thus, a rather conflicting pattern of results was evident. When comparing police work with other occupations and the responses of police with normative data, the results with regard to relative stressfulness have been inconsistent.

Rationales for the use of comparison groups in police stress research were rarely given, although Sigler and Wilson (1988) compared their police group to

teachers because both occupations have been designated as highly stressful. In order to investigate the stress associated with police work, it may be fruitful to have a comparison group that performs some basic functions that are similar to police work. For example, a great deal of police officers' time has been spent doing office duties, including paper work. Clerical workers also performed these tasks. Thus, if differences were detected between police officers and clerical workers, it may be due to the different occupational situations faced by police officers compared to those experienced by clerical workers. The research detailed previously has indicated mixed findings on this issue, with some researchers demonstrating police work to be more stressful (Ely & Mostardi, 1986; Stearns & Moore, 1990) and some indicating no differences between the two occupations (Gaines & Jermier, 1983; Pendergrass & Ostrove, 1984). Research has not demonstrated clerical work to be more stressful than police work. Thus, the available evidence suggested that police work was as stressful, but possibly more stressful, than clerical work.

It has been postulated that high stress occupations may be mythical (Burke, 1987b). Like police officers, air-traffic controllers have been targeted as a high stress occupation. However, research has demonstrated that air-traffic controllers were similar to other public sector employees on a number of measures of psychosocial stress (see Burke, 1987b). Thus, this study failed to support the claims that air-traffic controlling was more stressful than other occupations. It has been suggested that individuals working on jobs said to be highly stressful may have come to believe the stereotype and, therefore, a self-fulfilling prophecy was in operation (MacBride, 1984). Consequently, such employees may look for the signs of their inevitable deterioration where they might otherwise not have existed.

Therefore, a debate was evident concerning the existence of high stress occupations, and whether police work was more stressful than other occupations. This debate cannot be reconciled on the available evidence and until more studies

include comparison groups. Nevertheless, the balance of evidence to date indicated that police officers experienced stress in relation to aspects of their occupation.

3.5.2 Dependent variables

Table 1 details the dependent variables employed in police stress research. These dependent variables have consisted of self-report, psychophysiological and objective measures.

It is evident that most of the research in Table 1 used self-report data. Indeed, it appears that 70% of the research has used this methodology exclusively. Given the large proportion of research using self-report data, it was to be expected that all research areas documented in Table 1 have been investigated employing such measures. Thus, self-report data has been used to document the antecedents and the consequences of police stress. The results of this research have been documented throughout this chapter, and will not be repeated in detail here. This research has demonstrated police work to be stressful and that the stress has been initiated by a number of organisational and operational stressors.

It has been contended that the common self-report measures of stress tend to be contaminated by the personal characteristics of the individual, such as their values and personality (Fried et al., 1984). Such contamination can occur unintentionally and intentionally by the manipulations of participants (Lester et al., 1994). Research employing such methodology, in addition to the commonly used correlations between self-reported stress and self-reported psychological outcomes, should be cautiously interpreted due to the problem of common method variance (Fried et al., 1984). Further, stress has been described as a complex, whole body response, which has incorporated psychophysiological, cognitive, emotional and behavioural changes (Fleming & Baum, 1987; Steptoe, 1991). To monitor the changes that accompany stress comprehensively, it would be necessary to monitor

more than the subjective experience of stress. However, researchers have relied heavily on the use of self-report data (Balick & Herd, 1987; Burke, 1987c; Fleming & Baum, 1987; Ganster et al., 1982; O'Keeffe & Baum, 1990) to the exclusion of other types of measures. This may be seen as a limitation in the police stress literature.

Therefore, it was evident that researchers investigating police stress needed to incorporate psychophysiological measures into their designs. It can be seen from Table 1 that just 11% of researchers had included such measures in their investigations. Measures employed included vitamin (Hageman, 1982), catecholamine (Ely & Mostardi, 1986; Fusilier et al., 1987; Mayes et al., 1991; Peacock et al., 1983) and cholesterol levels (Ely & Mostardi, 1986; Kreitner et al., 1985; Quire & Blount, 1990; Williams et al., 1987; Young, 1994), HR (Norris et al., 1990; Williams et al., 1987) and BP (Ely & Mostardi, 1986; Kreitner et al., 1985; Norris et al., 1990; Norvell et al., 1988; Peacock et al., 1983; Stotland, 1986; Stotland & Pendleton, 1989; Young, 1994).

Seventy percent of research using psychophysiological dependent variables has focused on the effects of police stress on the physical health of police officers. As documented previously, police work has been associated with elevated risk for coronary heart disease (Ely & Mostardi, 1986; Kreitner et al., 1985; Norvell et al., 1988; Quire & Blount, 1990; Williams et al., 1987; Young, 1994), although evidence also suggested that with increased fitness and other intervention programmes such risk could be decreased (Norris et al., 1990; Quire & Blount, 1990; Williams et al., 1987; Young, 1994). Other research using psychophysiological measures has demonstrated the impact of shift work on police officers (Peacock et al., 1983) and the relationship between increased social support and lower DBP (Stotland & Pendleton, 1989) for police officers with high workloads.

The use of psychophysiological variables in police stress research should be viewed as encouraging. However, it must be noted that, of the research listed in Table 1, the majority of police stress research undertaken using such measures was conducted in the 1980s, with little occurring in the 1990s. Indeed, since 1992, just one study was listed as having used psychophysiological measures (Young, 1994). It was evident that police stress researchers have not been following those investigating other types of stress in incorporating psychophysiological measures in their research (e.g., Davis & Rodela, 1990; Evans & Carrere, 1991; Fox & Dwyer, 1995; Korunka et al., 1996; Kozena et al., 1995; Shapiro et al., 1993; Siegrist, 1995; Sims, 1995; Travers & Cooper, 1994). It appears that police stress researchers may not have been paying sufficient attention to the police stress process, as stress has been viewed as a whole body response, which could not be fully investigated using only self-report measures (Calhoun & Resick, 1993).

Further, of those studies employing psychophysiological dependent variables, only three studies have used control measurements. Baseline measures were taken in one study (Mayes et al., 1991), whereas a pre-test/post-test design was employed in the others (Norris et al., 1990; Pierce & Dunham, 1992). Large individual differences in psychophysiological measurements and fluctuations of such measurements have been recognised by researchers, and have led to the recommendation of baseline recordings and of multiple recordings (Balick & Herd, 1987; Fleming & Baum, 1987) of psychophysiological responses. Those investigating police stress evidently have not followed these recommendations. Thus, it was not possible from such research to consider how greatly police stress impacts upon individuals, because there were no baseline recordings to which responses can be compared. Thus, methodological deficiencies were evident in the paucity of police stress research that has utilised psychophysiological indices of stress.

Table 1 demonstrated that 23% of studies have used objective measures of stress. For example, some researchers have used archival data (DeLey, 1984; Fell et al., 1980; Honig & Reiser, 1983), whereas others have relied on the number of sick days taken (Alexander & Wells, 1991; Stotland, 1986; Stotland & Pendleton, 1989). Although this research was descriptive, and it added to the body of data demonstrating the consequences of police stress, it contributed little to the knowledge base about the nature of police stress and particularly the causes of this stress.

In summary, three main types of dependent variables have been employed in police stress research: self-report measures, psychophysiological responses and objective measures. The heavy reliance on self-report data has been criticised because the data can be contaminated and because stress has been postulated to be a whole body response, encompassing psychophysiological changes as well as subjective experience. Approximately 11% of the research documented utilised psychophysiological measures, but most of these studies did not employ adequate methodology, including the use of control measures.

3.5.3 Summary

It has been demonstrated that police officers have experienced a degree of stress related to their occupation. The relative stressfulness of police work, however, has not been adequately documented, mainly because researchers have not included comparison groups in their research. It also was evident that much of the research investigating police stress has relied primarily on self-report data. When researchers have employed psychophysiological measures, they have tended not to monitor baseline measurements. It appeared that strong conclusions regarding police stress have been drawn despite the methodological limitations of the research. There has been a distinct move in recent years for occupational stress

researchers to include psychophysiological dependent variables in their research (e.g., Davis & Rodela, 1990; Evans & Carrere, 1991; Fox & Dwyer, 1995; Korunka et al., 1996; Kozena et al., 1995; Shapiro et al., 1993; Siegrist, 1995; Sims, 1995; Travers & Cooper, 1994). However, those researching police stress have yet to employ psychophysiological measures widely in their research, and those who have adopted such measures have neglected basic methodological issues.

The extensive literature review presented, together with the critique of this research, suggested that those investigating police stress needed to include comparison groups in their research so that the relative stressfulness of police work could be determined. Further, to more comprehensively document the stress involved with this occupation, researchers needed to include psychophysiological and self-report measures in their research. It is contended that when more rigorous methodologies are employed, a more accurate picture of the police stress process will emerge.

CHAPTER FOUR

THE NATURE OF POLICE STRESS

4. THE NATURE OF POLICE STRESS

4.1 Introduction

It was evident that an abundance of research has documented the stress associated with the occupation of law enforcement. This research indicated that police officers experienced stress as a result of the organisation in which they worked and the operational tasks they performed. The relative stressfulness of police work, however, appeared unclear. This was mainly because the majority of police stress researchers had not included comparison groups in their designs. Further, the nature of police stress was not entirely clear, in part because researchers had relied extensively on self-report data, to the exclusion of other measures. Whereas others documenting the impact of stress on individuals had included psychophysiological measures in their research (e.g., Davis & Rodela, 1990; Evans & Carrere, 1991; Fox & Dwyer, 1995; Korunka et al., 1996; Kozena et al., 1995; Shapiro et al., 1993; Siegrist, 1995; Sims, 1995; Travers & Cooper, 1994), those investigating police stress had not followed suit. Additionally, the paucity of research that had included such indices of stress in their designs had generally failed to use adequate baseline measures. It was evident, therefore, that researchers investigating police stress needed to pay more attention to the measures of stress utilised and the control measures employed, including comparison groups and baseline measures.

The exclusive reliance on self-report data also was documented in the general stress literature (Bruning & Frew, 1987; Burke, 1987c; Fried et al, 1984). When researchers had employed psychophysiological indices of stress in their research, they often failed to control for the many factors that may influence the variables under study (Fried et al., 1984). Such variables included age (Arena et al., 1983; Harrison & Kelly, 1989; Sharpley, 1992; Sharpley & Scuderi, 1994; Steptoe et al.,

1990), sex (Allen et al., 1993; Sharpley, 1994), race (Light et al., 1993a, 1993b; Mills et al., 1993), family history of cardiovascular disorders (Anderson et al., 1989; Ditto, 1993; Fredrikson et al., 1991; Gellman et al., 1990; Goldstein & Shapiro, 1995; Miller & Ditto, 1991), posture (Gellman et al., 1990; Goldstein et al., 1992), caffeine consumption (Pincomb et al., 1987) and nicotine intake (Domino et al., 1992; Krebs et al., 1994; Pritchard et al., 1995; Rose & Behm, 1991).

As indicated, one way of investigating occupational stress involved comparing psychophysiological and subjective responses of employees on work and nonwork days. It was proposed that higher responses on work days reflected the stress experienced as a function of occupational activities (Goldstein et al., 1992; Theorell et al., 1985). However, some researchers who had utilised this methodology (e.g., Frankenhaeuser et al., 1989; Lundberg et al., 1989) demonstrated differential responding to work versus rest, rather than work versus nonwork, because they had instructed participants to relax at home and avoid physical activity.

Furthermore, those employing this methodology had used relatively short periods of time for monitoring responses to work stress (e.g., Frankenhaeuser et al., 1989; Goldstein et al., 1992; Lundberg et al., 1989; Steptoe et al., 1996). It was proposed that inconsistent results would be demonstrated when researching occupations that were unpredictable in job content. Additionally, comparison studies between occupations had not been included in studies employing this methodology. This was significant in that it was difficult to determine the relative stressfulness of occupations labelled as highly stressful (Burke, 1987b; MacBride, 1984).

The current study aimed to investigate the stressful nature of police work by monitoring the cardiovascular and self-reported responses of police officers over a 2 week period, encompassing both work and nonwork days. It was hypothesised

that cardiovascular and self reported measures of stress and arousal would be higher on work days than nonwork days. Due to the nature of police work it was hypothesised that all work days would not be the same as each other, with stressful occupational tasks being present only on some work days. Work days when stressful events occurred were compared to work days when no such events occurred, and to days away from work. It was expected that cardiovascular and self-reported measures would be higher on work days during which stressful events were experienced compared to other work days. Cardiovascular and self-reported measures were expected to be higher on both types of work days compared to nonwork days. Additionally, the police officers were compared to a control group of clerical workers, to enable conclusions to be drawn as to whether police work was more stressful than clerical work.

METHOD

4.2.1 Participants

Twenty police officers from a Tasmanian city police station and 20 matched clerical public servants participated in the study. All participants were male and were employed in non-supervisory positions. Male police officers were used exclusively because of the possibility of confounding the results by including officers of both sexes. Female police officers were demonstrated to have been exposed to different stressors than male officers and their reactions to shared stressors were different to male officers (Brown & Fielding, 1993). The small number of female police officers working at any particular Tasmanian police station also influenced the decision not to include them in the research.

The police participants had a mean age of 30.4 years (SD = 6.44) and the clerical group had a mean of 28.6 years (SD = 5.37) of age. The police officers

had been in the police force for a mean of 9.30 years (SD = 4.71), and had been at the current station for a mean of 3.83 years (SD = 3.35). The clerical workers had been employed by their organisation for a mean of 7.73 years (SD = 3.62), and had been in the current department for a mean of 4.75 years (SD = 3.62).

All participants were screened for medication use, and for a family history of heart disease and/or hypertension. Participation was voluntary and written informed consent was obtained. A copy of the consent form is presented in Appendix A.

4.2.2 Apparatus

HR and BP were measured using an OMRON HEM 403C digital sphygmomanometer. HR was recorded in beats per minute (BPM) and two measures of blood pressure were extracted, SBP and DBP (mmHg-millimetres of mercury).

4.2.3 Materials

A Background Information Sheet was designed by the investigator to gather demographic information: age; marital status; number of children; years in the police force/public service; years in the current department; the number of cigarettes smoked per day, where applicable; currently prescribed medication; and family history of hypertension or heart disease.

The Daily Activities Log, designed by the experimenter, was provided for participants to record the tasks they had completed during the day, together with the time of these, and their relative stress rating on a 4 point scale (0 = no stress to 3 = much stress). The completed logs gave an indication of the activity levels of each

participant on each day, the operational tasks performed on working days, and the tasks engaged in prior to the morning and afternoon measurements.

A modified version of the List of Recent Experiences (Headey, Glowacki, Holmstrom & Wearing, 1985) was used to quantify the number of favourable and negative events experienced by participants during the previous 12 months prior to their commencing the study. This measure was chosen because it had been developed for use within a current Australian population, and could be assumed to reflect Australian cultural values. The scale consisted of 44 items, and examined factors such as health, finances and personal relationships. An unweighted score of one was assigned to each positive and negative event item experienced. This scale was included to control for the influence of nonwork related stress which has been demonstrated to influence levels of occupational stress (Nowack & Pentkowski, 1994; Price & Spence, 1994).

Subjective measurements of stress and arousal were obtained using Visual Analogue Scales (VASs). VASs have been demonstrated to be highly sensitive and reliable, and suitable for frequent and repeated measurement for a within-subject design (McCormack, Horne & Sheather, 1988). In addition, they have been documented to be a psychometrically sound measure when used in a between-subjects design (McCormack et al., 1988). The two VASs utilised measured bipolar dimensions of state stress and state arousal (King, Stanley & Burrows, 1987). The stress VAS was anchored with the words "comfortable or calm" on the left, and the words "worried or uptight" on the right. The arousal VAS was anchored with the words "active or energetic" on the left, and "sleepy or passive" on the right. The VASs were scored out of 100, with higher scores representing a more negative experience.

A Record Sheet was designed to provide the means by which participants could record when and where the measurements were taken. The two VASs were then included, followed by places for the BP and HR measurements. Lastly, there

were questions asking if the participants had consumed tea, coffee, alcohol or food during the hour preceding the recording.

Copies of the materials are presented in Appendix B.

4.2.4 Procedure

In the first instance, all participants were contacted by the supervisor of their respective department, and given an information sheet outlining the requirements of participation in the study (see Appendix C). All interested personnel completed a Background Information Sheet which was returned to the researcher. All participants worked from 8 a.m. to 4 p.m. or 9 a.m. to 5 p.m. For the police officers, the shift was preceded by 4 days leave followed by 6 to 8 work days, and ended with 2 days leave. The clerical workers commenced with a weekend, followed by 5 work days, a weekend, 5 work days, and concluded on the following Sunday afternoon. The days away from work were used as control measurements. Casual BP recordings were taken prior to commencing and finishing work, and at the corresponding times on nonwork days. Whereas ambulatory recordings of psychophysiological parameters generally have been deemed to be preferable (Schnall et al., 1990), the duration of the study precluded the use of such a measurement system.

The researcher met the participants for a training session either individually or in small groups the day prior to the commencement of leave. The training session was standardised. At the commencement of the session the confidential nature of the study was emphasised. Participants were reassured that senior personnel would not have access to any materials used in the study.. To facilitate this, questionnaires and recording sheets carried identification numbers instead of names. The requirements of participating in the study were detailed. The participants' informed consent in writing was sought.

Following this, the use of the sphygmomanometer was demonstrated. Each participant was guided through the placement of the cuff on the upper arm, and the operation of the sphygmomanometer. Participants practised using the sphygmomanometer several times. Assistance was given as required, though few difficulties were encountered by the participants. Whereas it would be desirable for a trained experimenter to take the BP measurements, a range of factors prevented this from taking place. For example, invasion of privacy, the length of the study, and the number of participants involved, played a part in the decision to train participants to use the equipment. The relative ease of using digital sphygmomanometers aided this decision.

All participants were then guided through the procedure required of them. They were instructed to sit for at least ten minutes prior to taking every measurement and to avoid foods, tea, coffee and alcohol for at least the hour prior to measurements being recorded. The importance of following these instructions was emphasised. Participants then used the sphygmomanometer again, and completed a practice Recording Sheet and Daily Activities Log. The List of Recent Experiences (Headey et al., 1985) was then completed. A second copy of the information sheet was given to them to remind them of the procedure.

During the study, participants kept a record of measures for the VASs, HR and BP, in that order, on work and nonwork days for 8 a.m. and 4 p.m. (or the time corresponding to their work shift) for 2 weeks. Work day measurements were taken at the work place. Following the afternoon measurement, participants completed the Daily Activities Log.

4.2.5 Design

A 2 x 2 x 2 factorial design was initially employed. A series of group (police officers, clerical workers) x type of day (work, nonwork) x time (morning,

afternoon) designs were used for each dependent variable (HR, SBP, DBP, self-reported stress, self-reported arousal) to test for differences between the two occupations and between work and nonwork days. Further, a 2 x 3 factorial design was employed. This series of group (police officers, clerical workers) x type of day (stressful events, nonevents, nonwork) designs were used for each dependent variable to test for differences between the two groups and between different types of work days.

4.2.6 Data analysis

A significance criterion of .05 was adopted for all analyses and a Huynh-Feldt correction was applied to all Analyses of Variance (ANOVA). All analyses were two-tailed. Average scores for each participant on each of the five dependent variables were employed for separate repeated-measures ANOVAs. These ANOVAs were used to test for differences between the two groups and for differences between the different types of days. Means comparisons, as calculated by SuperANOVA (Abacus Concepts, 1989), were employed to test for significant differences between the levels of variables in significant interactions and main effects. While the number of ANOVAs was large, the ratio of participants to dependent variables prevented the use of MANOVA (Tabachnick & Fidell, 1989).

The first nonwork day measurement was discarded for the police officers, as this followed a week of night or afternoon shift. Since the police officers were instructed on the procedures of the study on the morning after finishing night shift, and the next day was their first day of the study, the first data used in the analyses were actually 48 hours following night shift. It has been demonstrated that the circadian rhythm of BP, and to a lesser extent HR, reverses rapidly in people working different shifts (Sundberg, Kohvakka & Gordin, 1988). Research has indicated that 24 hours was sufficient for the circadian rhythm to re-establish itself

to the new sleep-wakefulness cycle associated with a new shift. Thus, as the officers had just finished night shift prior to commencing this study, the data from the first 48 hours was not used as participants' circadian rhythms would be readjusting to the new sleep-wakefulness cycle.

All measurements that were taken without the participant complying with the instructions given (e.g., avoid consuming tea, coffee or alcohol within 1 hour of a measurement) were discarded. Very few measurements coincided with noncompliance. Additionally, there were no patterns in the noncompliance, in that they were distributed evenly across morning and afternoon measurements, and on work days (both stressful and nonstressful) and nonwork days.

RESULTS

All ANOVAs were run using SuperANOVA (Abacus Concepts, 1989). The results of this study have been reported elsewhere (McLaren, in press).

4.3.1 Demographic data

Analysis of the demographic data collected on the Background Information Sheet demonstrated no significant differences between the two groups. Groups did not differ significantly on the variables of age, $F(1, 38) = 0.90$, $p > .05$, years in the police force or public service, $F(1, 38) = 0.72$, $p > .05$, years in the current department, $F(1, 38) = 1.77$, $p > .05$, or the amount of tea, coffee and alcohol consumed per day, $F(1, 38) = 1.69$, $p > .05$.

4.3.2 List of Recent Experiences

The police reported a mean of 1.70 (SD = 1.30) favourable and 2.10 (SD = 1.45) adverse events during the past 12 months. The clerical workers reported a mean of 2.10 (SD = 1.71) favourable and 2.50 (SD = 1.98) adverse events during the same period of time. The number of favourable, $F(1, 38) = 0.69$, $p > .05$, and the number of adverse events experienced, $F(1, 38) = 1.01$, $p > .05$, did not differ significantly between groups.

4.3.3 Work days versus nonwork days

Mean HR, SBP, DBP, stress VAS and arousal VAS scores and standard deviations for both groups are presented in Table 2.

Heart Rate

Analysis of the HR data from the total sample demonstrated a significant interaction between type of day and time of day, $F(1, 38) = 11.36$, $p < .002$. HR was significantly higher on mornings of work days than on mornings of nonwork days, $F(1, 38) = 29.54$, $p < .001$. However, there was no difference between the afternoon measurements on work days and nonwork days, $F(1, 38) = 0.45$, $p > .05$. HR was significantly higher in the afternoon than in the morning on nonwork days, $F(1, 38) = 17.53$, $p < .001$. No such increase was evident on work days, $F(1, 38) = 0.34$, $p > .05$.

Table 2. Means and standard deviations for cardiovascular and self-report measures for mornings and afternoons on work and nonwork days for police and clerical workers.

Variable	Group		WD-Morn	WD-After	NW-Morn	NW-After
HR	Police	M	72.29	72.68	68.27	70.60
		SD	8.27	7.48	5.67	7.27
	Clerical	M	70.17	68.88	65.75	69.92
		SD	8.00	8.63	7.83	8.73
SBP	Police	M	124.92	126.87	121.92	123.35
		SD	10.39	8.68	19.71	19.67
	Clerical	M	123.86	125.84	119.27	122.12
		SD	6.23	9.14	7.41	7.02
DBP	Police	M	77.70	79.61	76.74	76.23
		SD	9.36	19.27	10.92	11.63
	Clerical	M	77.68	80.98	76.64	77.00
		SD	6.34	7.50	6.31	5.54
Stress VAS	Police	M	25.08	37.92	20.65	27.25
		SD	15.10	18.47	14.61	15.43
	Clerical	M	36.35	45.40	25.78	31.51
		SD	10.94	12.35	12.35	10.41
Arousal VAS	Police	M	55.53	66.60	42.65	58.66
		SD	20.53	12.15	25.58	20.69
	Clerical	M	58.78	55.72	41.62	50.59
		SD	10.52	8.92	15.74	12.61

Note. WD = Work days; NW = Nonwork days; Morn = Morning; After = Afternoon

Blood Pressure

Two main effects were demonstrated for SBP. The main effect for type of day demonstrated that SBP was significantly elevated on work days compared to nonwork days, $F(1, 38) = 28.07$, $p < .001$. There was a main effect for time of day, $F(1, 38) = 9.60$, $p < .005$, indicating that SBP was significantly higher in the

afternoon than in the morning. No interaction between work status and time of day was evident.

An interaction between type of day and time of day was evident for DBP, $F(1, 38) = 6.78$, $p < .02$. Although there was no difference between work and nonwork days in the mornings, afternoon measurements taken at work were significantly higher than measurements taken at the corresponding time at home, $F(1, 38) = 25.43$, $p < .001$. DBP increased significantly during work days, $F(1, 38) = 12.76$, $p < .001$. Such an increase was not evident on nonwork days, $F(1, 38) = 0.91$, $p > .05$.

Stress VAS

The self-report data for the stress VAS demonstrated two significant results. The first was an interaction between type of day and time of day, $F(1, 38) = 4.35$, $p < .05$. Stress ratings were higher on work days than nonwork days, $F(1, 38) = 21.30$, $p < .001$ (mornings), $F(1, 38) = 57.21$, $p < .001$ (afternoons). Ratings on both days were significantly higher in the afternoons than in the mornings, $F(1, 38) = 45.43$, $p < .001$ (work days), $F(1, 38) = 14.38$, $p < .001$ (nonwork days).

There was a main effect for group, $F(1, 38) = 4.36$, $p < .05$. The clerical workers rated themselves as feeling more stressed ($M = 34.76$, $SD = 12.96$) than the police officers ($M = 27.72$, $SD = 16.92$).

Arousal VAS

The self-reports of arousal demonstrated two significant interactions, between type of day and time of day, $F(1, 38) = 5.49$, $p < .03$, and between group and time of day, $F(1, 38) = 7.25$, $p < .02$. Self-reported arousal increased from morning to afternoon on nonwork days, $F(1, 38) = 23.75$, $p < .001$. Morning ratings were significantly higher for work days than nonwork days, $F(1, 38) = 34.35$, $p < .001$.

Afternoon measurements were significantly higher at work than at home, $F(1, 38) = 6.48$, $p < .02$.

The second interaction, between group and time of day, indicated that police officers rated themselves as feeling significantly more aroused in the afternoon than the clerical group, $F(1, 38) = 5.12$, $p < .03$. Further, arousal increased across the day for the police officers, $F(1, 19) = 18.01$, $p < .001$, whereas no such increase in arousal was noted for the clerical workers, $F(1, 19) = 1.10$, $p > .05$.

4.3.4 Work days with and without stressful events

Mean afternoon recordings for work days during which the participants rated the occurrence of an event as "moderately" or "very" stressful were compared to mean afternoon recordings from work days during which no such events occurred. Both sets of work day afternoon recordings were compared to the corresponding afternoon recordings on nonwork days.

Twelve police officers and 11 clerical workers reported at least 1 day during which a stressful event occurred at work. For the police, these events included attending serious car accidents, death notifications, appearance as a witness in a court of law, and attending sexually assaulted victims. The clerical workers tended to cite "work meetings" as stressful. The number of days included in the following analyses ranged from 1 day to 5 days for participants from both groups, with the average number of days being approximately 3 for both groups. The number of days included in the analyses did not differ between groups, $F(1, 21) = 2.42$, $p > .05$. Mean HR, SBP, DBP and self-report scores for afternoon measurements can be examined in Table 3.

Table 3. Means and standard deviations for cardiovascular and self-report measures for afternoons on work days when stressful events have been experienced, on other work days and on nonwork days for police and clerical workers.

Variable	Group		WD-Ev	WD-Nonev	NW
HR	Police	M	73.74	72.63	73.15
		SD	10.15	6.55	6.25
	Clerical	M	70.81	68.56	70.92
		SD	9.68	9.64	7.41
SBP	Police	M	128.57	123.72	121.10
		SD	9.01	5.02	7.25
	Clerical	M	127.18	126.06	123.37
		SD	8.83	7.93	6.18
DBP	Police	M	76.47	75.74	72.27
		SD	9.76	7.66	7.65
	Clerical	M	82.69	79.03	77.70
		SD	9.23	5.99	4.49
Stress VAS	Police	M	47.42	39.87	28.13
		SD	28.29	18.12	13.01
	Clerical	M	55.62	43.58	26.63
		SD	16.86	11.28	7.62
Arousal VAS	Police	M	67.73	64.40	55.94
		SD	19.17	16.56	20.06
	Clerical	M	59.60	55.84	49.23
		SD	11.44	12.45	15.75

Note. WD = Work days; NW = Nonwork days; Ev = Events; Nonev = Nonevents

Heart Rate

Analyses of the HR data demonstrated no significant differences between the different work days and the nonwork days, $F(2, 42) = 0.48$, $p > .05$.

Blood Pressure

A main effect for type of day was evident with regard to SBP, $F(2, 42) = 9.36$, $p < .001$. SBP was significantly higher on stressful event work days

compared to nonevent work days, $F(1, 42) = 5.23$, $p < .04$, and to nonwork days, $F(1, 42) = 18.69$, $p < .001$. There was a tendency for SBP to be higher on nonevent work days compared to nonwork days, $F(1, 42) = 4.15$, $p = .054$.

A main effect for type of day also was shown for DBP, $F(2, 42) = 8.78$, $p < .003$. There was a tendency for stressful event work days to be higher than nonevent work days, $F(1, 42) = 4.00$, $p = .06$. Both types of work days were significantly higher than nonwork days, $F(1, 42) = 17.56$, $p < .001$ (stressful events), and $F(1, 42) = 4.79$, $p < .05$ (nonevents).

Stress VAS

The self-report data for perceived stress indicated a main effect for type of day, $F(2, 42) = 24.05$, $p < .001$. Ratings for stressful event work days were higher than nonevent work days, $F(1, 42) = 7.84$, $p < .02$, and nonwork days, $F(1, 42) = 47.54$, $p < .001$. Nonevent work days were rated as more stressful than nonwork days, $F(1, 42) = 16.78$, $p < .002$.

Arousal VAS

Again, a main effect for type of day was demonstrated, $F(2, 42) = 7.31$, $p < .003$. There was no significant difference in arousal ratings between the two work conditions, $F(1, 42) = 1.44$, $p > .05$. However, both work conditions were rated as significantly more arousing than nonwork days, $F(1, 42) = 14.01$, $p < .001$ (stressful events), and $F(1, 42) = 6.48$, $p < .02$ (nonevents).

DISCUSSION

It was anticipated that cardiovascular and self-reported feelings of stress and arousal would be higher on work days than nonwork days. HR was significantly elevated on the mornings of work days compared with nonwork days, but no such

difference was evident in the afternoon. SBP was clearly elevated on work days. Interestingly, DBP was higher in the afternoons of work days compared with nonwork days, but not in the mornings. This pattern was the reverse of that demonstrated for HR. Self-reported ratings of stress were higher on work days than nonwork days, with the highest ratings being in the afternoon. The result for self-reported arousal was similar. The limitation of previous research (e.g., Frankenhaeuser et al., 1989; Goldstein et al., 1992; Harshfield et al., 1982; Lundberg et al., 1989; Steptoe et al., 1996; Theorell et al., 1985) has been the difficulty in making definitive statements about the differential effects on stress and arousal of work and nonwork days because of the short duration of measurement. The results of this study demonstrated psychophysiological and psychological differences between work and nonwork days over a 2 week period.

Another shortcoming of previous research (e.g., Frankenhaeuser et al., 1989; Lundberg et al., 1989) has been the tendency to adopt a methodology that requires participants to rest and avoid non-arousing activities during the nonwork periods of measurement. Undoubtedly this approach delineates arousal differences between work activities and rest, and does allow researchers to have a baseline to which psychophysiological reactivity can be compared. This methodology does not, however, allow the investigation of natural work/nonwork day differences to be examined. The current study replicated basic work/nonwork day differences, in stress and arousal, even when the participants engaged in normal, and sometimes quite physical, activities on their days off. It may be argued, particularly for the police officers, that work days were associated with physical activity. However, the Daily Activities Logs indicated that participants from both groups engaged in physical activities, such as gardening and mowing the lawns and playing sport, on their nonwork days. The fact that significant differences were observed between work and nonwork days when physical activity was occurring on both types of days indicated that physical activity was not the factor responsible for these

differences. This was consistent with a recent study on firefighters (Steptoe et al., 1996) in which physical activity did not explain all the variance demonstrated between work and nonwork days. Additionally, the immediate impact of physical activity would be eliminated, or at least reduced, by the participants sitting for 10 minutes prior to taking their measurements. Indeed, this factor alone suggests that the differences between work and nonwork days, demonstrated in this study, were conservative. Thus, it appears that the difference between work and nonwork days lies in the stress-related nature of the activities rather than the fact that they were physically more arousing.

It may be argued that the significance of time of day (morning versus. afternoon) could be attributed to the body's circadian rhythm (Millar-Craig et al., 1978) or to the sleep-wakefulness cycle (Clark et al., 1987; Pickering, 1988). However, the significant differences between work and nonwork days supported the body of literature suggesting that engaging in work-related activities did lead to an elevation in cardiovascular and other psychophysiological functions (Frankenhaeuser et al., 1989; Goldstein et al., 1992; Harshfield et al., 1982; Lundberg et al., 1989; Theorell et al., 1985). The rationale was that the differences in measurements between work days and nonwork days reflected the stress experienced during work. Indeed, perceived stress at work has been consistently reflected in the cardiovascular and neuroendocrine functions of the worker (Lundberg et al., 1989).

It also was anticipated that not all work days would be comparable with regard to levels of stress and arousal, given the inconsistent nature of police work. SBP was significantly higher on work days when stressful events occurred compared with work days when no such events occurred. There was a trend for DBP to follow this pattern. Ratings of stress also were higher on stressful event work days, but arousal ratings were similar on both types of work days. It appeared, then, that different types of work days could be distinguished as well as

the workday-nonwork day distinction. DBP, stress ratings and arousal ratings were significantly higher on nonevent work days than nonwork days, although SBP did not clearly demonstrate this difference. The factor of physical activity may again be raised here. It may be that stressful work events were associated with increased physical activity for police officers. However, it must be noted that the majority of these work events, as reported in the Daily Activities Logs, occurred well before the afternoon measurements. Thus, the effects of physical activity would have diminished prior to the measurements being taken. The results of this study supported earlier research which demonstrated clear differences in BP for stressful work days compared with low stress work days in a group of medical students (Sausen et al., 1992).

These results suggested that the magnitude of the difference between work and nonwork days with regard to stress and arousal may be affected by the events that occurred on the days of measurement. This presents a problem for those studies that measured stress and arousal over a short time period, such as 24 hours. It was not possible within such a short period to identify a typical work day. Researchers should be cautious in assuming that a typical work day existed for all occupations, or at least in assuming that a typical work day had been included in the time frame of a particular study. Indeed, it was the inconsistency between participants in experiencing stressful event work days that may be of most concern to researchers employing a work day-nonwork day methodology. In this study, approximately 50% of police and clerical workers reported at least 1 stressful event work day over the 2 week period.

Stability of cardiovascular function over a 2 day period was indicated from an initial examination of the results of a study examining work-related stress in paramedics (Goldstein et al., 1992). However, when the ambulatory recordings were analysed in relation to specific situations, BP was demonstrated to increase during the work day. For example, SBP increased while paramedics were at the

scene of an accident but no such increase was evident when the participants engaged in a nonwork activity such as shopping. A comparison of similar activities, for example, riding in an ambulance and riding in a domestic car, evidenced a rise in SBP of almost 10 mmHg during the ambulance ride. Whereas work and nonwork days did not differ overall, specific activities performed on the work day did result in an increase in BP when compared to similar activities on a nonwork day. This result, in conjunction with the results of the current study, illustrated the importance of the relationship between specific events and elevated BP.

Two group differences were demonstrated in this study. Clerical workers reported significantly higher levels of stress than the police officers, although in both groups actual stress ratings were relatively low. The second group difference was demonstrated with regard to the level of arousal, with police officers rating themselves as feeling more aroused in the afternoon than the clerical group. Further, the arousal ratings made by the police participants were higher in the afternoon than they were in the morning. No such increase in arousal was evident for the clerical workers. It may be that the two groups interpreted their work and/or psychophysiological arousal in different ways. The clerical workers reported general levels of stress, whereas the police officers reported increased levels of arousal. The high levels of arousal reported by the police officers were consistent with a study that investigated HR changes in firefighters as a response to a fire alarm (Kuorinka & Korhonen, 1981). HR increases were interpreted as being due to arousal and abrupt physical activity, rather than to any emotional or psychological factor such as anxiety. While stress ratings were elevated in the afternoons, the police officers in this study rated themselves as feeling more aroused than stressed. These group differences have reinforced the need to record both stress and arousal as separate dimensions, a proposition that already has been identified (King et al., 1987).

No other group differences were evident. A previous study reported significant differences between police and clerical worker groups on a range of psychophysiological and psychological measures including BP and recent life change scores (Ely & Mostardi, 1986). Results demonstrated that police officers had significantly elevated DBP and significantly higher life change scores compared with the clerical workers. The psychophysiological difference reported was interpreted as indicating that the police officers were under elevated psychosocial stress. The higher life change scores indicated that police officers had more change in their life per unit than the comparison group.

No such differences were found in the current samples of police officers and clerical workers. Results on the List of Recent Experiences indicated that prior to the commencement of the study, no differences existed between the two groups on the number of positive or negative experiences. This was important, given that nonwork related stress has been demonstrated to influence levels of occupational stress (Nowack & Pentkowski, 1994; Price & Spence, 1994). The similarities between the two groups enabled stronger conclusions to be drawn. It appeared that police work was not more stressful than clerical work. The cardiovascular measures demonstrated no differences between the two groups of workers. It was the self-report data which differentiated the two groups. Whereas the clerical workers reported more stress, the police officers reported more arousal. As indicated previously, this may be due to a difference in interpreting psychophysiological arousal. This study also showed that participants from both groups experienced stressful events on their work days. However, the experiences of the two groups during their work days were very different. Overall, the results did not support the idea that police work was a highly stressful occupation and it was not more stressful than clerical work. It was the nature of the work stressors that distinguished the two groups and not the reactions to these stressors.

In summary, the results of this study have replicated results from previous studies that psychophysiological and psychological measures of stress and arousal were higher on work days than nonwork days. The results also indicated that work days were not typical or consistent in terms of the events experienced by workers on a given day. It was contended that investigators employing a methodology that limited the sampling of work days to brief periods may be producing results that were inaccurate or inconsistent because work days differed in content. It was difficult to determine a typical work day for police officers and clerical workers. It also was demonstrated that these two groups of workers were quite similar in terms of the measured aspects, except for self-reported stress and arousal. The events that were rated as stressful by the participants varied according to occupation. The higher cardiovascular and subjective responses on work days compared to nonwork days indicated that police officers did experience stress as a function of their occupation. This stress was associated with particular operational tasks. Further, the results suggested that police work was not highly stressful and that it was not more stressful than clerical work.

It was evident from this study that the stress experienced by the police officers was related, at least in part, to the operational tasks they performed. Three particular tasks, which were noted as stressful by the police officers, in this study also have been reported as stressors by other Tasmanian police officers (McLaren, 1990). These tasks were attending the scene of a serious car accident, delivering a death notification and attending court as a witness. It has previously been noted that very little has been documented about the stress associated with specific operational tasks. Given the consistency with which these tasks appear to have affected Tasmanian police officers, they were subjected to further investigation. A review of the stress literature indicated that it was not sufficient to limit the investigation to the nature of the operational tasks. An influential stress theory, the transactional model of stress, proposed that it also was important to investigate

individuals' perceptions of the work situations and the coping strategies utilised to deal with the situations (Folkman, Lazarus, Dunkel-Schetter, et al., 1986; Folkman, Lazarus, Gruen & DeLongis, 1986; Lazarus & Folkman, 1984). Considering that very little of the police stress research has been conducted within this theoretical framework, it was evident that the three work situations should be investigated within the transactional model of stress.

CHAPTER FIVE

COGNITIVE APPRAISAL AND COPING AS MEDIATORS OF WORK STRESSORS

5. COGNITIVE APPRAISAL AND COPING AS MEDIATORS OF WORK STRESSORS

5.1 The relationship between work stressors, appraisal and coping

The results of the previous study, and from research using paramedics as participants (Goldstein et al., 1992), indicated that specific work situations were associated with increased stress and arousal. For Tasmanian police officers, three operational tasks have been demonstrated to be particularly stressful. They were: attending a serious car accident, delivering a death notification and appearing in court as a witness. Whereas there was some indication in the literature as to the nature of the stress associated with court, very little has been documented about the other tasks. It was necessary, therefore, to further investigate the components of these situations, and the stress associated with them.

Inspection of the general stress literature indicated that it was not sufficient merely to investigate the actual work situations. A review of the transactional model of stress suggested that the ways in which police officers cognitively appraised the work situations ,and subsequently coped with them, was vital to the understanding of the impact of such situations on the officers. Therefore, it was within a transactional model of stress that the operational tasks were investigated.

5.2 The transactional model of stress

Richard Lazarus (1966) proposed one of the most influential models of stress. It has been refined in the decades since (e.g., Folkman & Lazarus, 1980; Folkman, Lazarus, Dunkel-Schetter, et al., 1986; Folkman, Lazarus, Gruen & DeLongis, 1986; Lazarus & Folkman, 1984). Within a transactional model of stress, psychological stress was defined as "a particular relationship between the

person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 19). The central processes of the transactional model of stress have been reported to be cognitive appraisal and coping. These two processes were critical mediators of the person-environment relationship (Folkman, Lazarus, Dunkel-Schetter, et al., 1986).

5.2.1 Cognitive appraisal

It was evident from research with humans facing adverse situations, such as natural disasters (Rochford & Blocker, 1991) or being prisoners of war (Fairbank, Hansen & Fitterling, 1991), that individuals responded to such situations in different ways. For example, some former prisoners of war suffered from PTSD, while others did not (Fairbank et al., 1991). In order to understand inter-individual differences under comparable conditions, the cognitive processes that intervene between the encounter and the response must be considered (Lazarus & Folkman, 1984). Thus, cognitive appraisal was considered to be an important component of the stress process. The proposition that cognitive processes mediated individuals' responses to the environment has been widely accepted in the stress literature (Croyle, 1992; Dewe, 1991b, 1992; Folkman, Lazarus, Dunkel-Schetter, et al., 1986; Folkman, Lazarus, Gruen & DeLongis, 1986; Gadzella et al., 1991; Larsson et al., 1988; Ptacek et al., 1992).

Cognitive appraisal has been described as the process through which a person evaluated whether a particular encounter with the environment was relevant to their well being, and if so, in what ways (Folkman, Lazarus, Dunkel-Schetter, et al., 1986). It has been postulated to consist of two processes. Primary appraisal referred to the person evaluating whether they had anything at stake in a particular encounter, that is, did the encounter impact on them in any way. In

secondary appraisal, the individual evaluated whether anything could be done to overcome or prevent harm, or to improve the prospects for benefit. Coping options were evaluated at this stage (Lazarus & Folkman, 1984).

Primary Appraisal

An excellent account of primary appraisal has been given by Lazarus and Folkman (1984). Their view of primary appraisal will be summarised here. Three kinds of primary appraisal have been distinguished: irrelevant, benign-positive and stressful. Irrelevant primary appraisals were reported to occur when an encounter with the environment carried no implication for a person's well-being. Put simply, in such encounters, there was nothing to be lost or gained. Benign-positive primary appraisals occurred if the outcome of an encounter was regarded as positive. These types of appraisals were characterised by positive emotions, such as joy, love, happiness and exhilaration. The third kind of primary appraisal, stress appraisals, included appraisals of harm/loss, threat and challenge. Harm/loss appraisals referred to damage, such as an incapacitating illness or loss of self-esteem, that had occurred already. Threat appraisals referred to harm or loss that was anticipated, rather than already having occurred. They were characterised by negative emotions, such as fear, anxiety and anger. Lazarus and Folkman regarded threat appraisals as having adaptive significance, because they permitted anticipatory coping. Challenge appraisals, characterised by positive emotions such as excitement and exhilaration, focused on the potential for gain. Challenge appraisals were viewed as having much in common with threat appraisals, the major aspect being the mobilisation of coping resources.

Threat and challenge appraisals were postulated as separate constructs, and the two were not regarded as poles on a single continuum (Lazarus & Folkman, 1984). Further, the two concepts were separated in terms of their cognitive component and their affective component. It has been noted, however, the both

appraisals have been demonstrated to occur simultaneously. In one study, 94% of the student sample identified both threat and challenge appraisals in relation to a midterm examination (Folkman & Lazarus, 1985). These results confirmed the use of these two appraisals in anticipation of an event. These two constructs have been the focus of further research (e.g., Folkman, Lazarus, Gruen & DeLongis, 1986; Larsson et al., 1988; Ptacek et al., 1992), since they were the appraisals that called for coping efforts.

Folkman, Lazarus, Gruen and DeLongis (1986) investigated the consistency of individuals' appraisals across stressful events. In this study, 85 married couples from California were interviewed in their homes once a month for 6 months. The husbands and wives were interviewed separately about the most stressful event that had occurred in the last week. A range of self-reported measures were completed. Results demonstrated autocorrelations across the reported encounters ranging from .12 to .37, with the highest consistency being for protecting one's self-esteem. This research did not, however, document the frequency of use of various appraisals. The actual encounters being appraised were not documented either. Therefore, it was not possible to determine the most commonly cited appraisals, nor how particular encounters were appraised.

In another study of cognitive appraisal (Ptacek et al., 1992), 152 college students reported the most stressful event of the day for 21 consecutive days. Each day they completed scales measuring cognitive appraisal and coping. Results indicated that 48% of events were appraised as challenging, and 37% of events as threatening. Like the previously reviewed study, it was not possible to determine how specific situations were appraised. Research suggested, however, that there was some consistency when appraising stressful events, although the evidence was not strong (Larsson et al., 1988).

Research using the same methodology as Folkman, Lazarus, Gruen and DeLongis (1986) has investigated the relationship between particular appraisals

and the outcome of specific encounters (Folkman, Lazarus, Dunkel-Schetter, et al., 1986). Analyses indicated that the difference between satisfactory outcomes and unsatisfactory outcomes for stressful events in the group of married couples was due to a single appraisal, losing respect for someone else. It was clearly demonstrated that unsatisfactory outcomes to situations were associated with increased loss of respect. No other differences between the types of appraisal were demonstrated in relation to satisfaction with outcome of events.

Secondary Appraisal

It has been proposed that the process of secondary appraisal is activated when a situation has been appraised as threatening or challenging. In this process an individual evaluated what action could be taken to meet the threat or challenge of the encounter. Secondary appraisal has been defined as a "complex evaluative process that takes into account which coping options are available, the likelihood that a given coping option will accomplish what it is supposed to do, and the likelihood that one can apply a particular strategy or set of strategies effectively" (Lazarus & Folkman, 1984, p. 35).

A number of types of secondary appraisal were evident in the literature. In several studies, Lazarus and his colleagues had participants rate the extent to which the target encounter was one they: could change; had to accept; needed to know more before they could act; or had to hold themselves back from doing what they wanted to do (Folkman & Lazarus, 1980; Folkman, Lazarus, Dunkel-Schetter, et al., 1986; Folkman, Lazarus, Gruen & DeLongis, 1986). These options were extended in another study to include the secondary appraisal of being able to reasonably resolve the situation with the available resources (Larsson et al., 1988). Dewe (1991b, 1992) added two more secondary appraisal options to tap appraisal in an occupational setting. He had participants rate if the situation was one where the organisational bureaucracy made it difficult to deal

with the situation, or was one where difficulties would have been experienced if they had dealt with the situation in the manner in which they wanted.

Research has indicated that the consistency of individuals' secondary appraisal of events was similar to that of primary appraisals. Research on appraisal in married couples demonstrated autocorrelations across five encounters to range from .12 to .24, with the most consistent being "having to hold back" (Folkman Lazarus, Gruen & DeLongis, 1986). As previously noted for the primary appraisals documented in this study, this research did not detail the most commonly reported appraisals, nor how specific situations were appraised.

A relationship between secondary appraisal and satisfaction with outcomes has been demonstrated (Folkman, Lazarus, Dunkel-Schetter, et al., 1986). When married couples appraised situations as being able to be changed and as not having to hold back before acting, these situations resulted in satisfactory outcomes significantly more often than they resulted in unsatisfactory outcomes. There were no differences in the use of acceptance and needing to know more information before acting between situations with satisfactory and unsatisfactory outcomes.

5.2.2 Coping

Coping has been defined as the "person's cognitive and behavioural efforts to manage...the internal and external demands of the person-environment transaction that is appraised as taxing or exceeding the person's resources" (Folkman, Lazarus, Gruen & DeLongis, 1986, p. 572). An important feature of this definition of coping was that it made no *a priori* assumptions about what constituted good or bad coping; coping has been defined simply as a person's efforts to manage demands, whether or not the efforts were successful (Folkman, Lazarus, Dunkel-Schetter, et al., 1986).

Within a transactional model of stress, coping has been viewed as a process. Lazarus and Folkman (1984) contended that there were three main features of the coping process, which will be summarised here. First, assessments of coping were concerned with what a person actually did rather than what a person usually did. Second, this assessment occurred in response to a specific context, and that in order to understand coping, this specific context had to be made known. Third, the coping process meant that changes in thoughts and behaviours occurred throughout an encounter.

Two main functions of coping have been identified, namely management of the problem that was causing distress (problem-focused coping) and the regulation of emotions or distress (emotion-focused coping) (Carver, Scheier & Weintraub, 1989; Folkman & Lazarus, 1980, 1985; Pearlin & Schooler, 1978). When using problem-focused coping strategies, efforts were often seen to be directed at defining the problem, generating alternative solutions, weighing the alternatives in terms of costs and benefits, choosing among them and acting (Lazarus & Folkman, 1984). Research using Folkman and Lazarus' (1980) Ways of Coping Checklist have demonstrated that problem-focused coping strategies were likely to be used when situations were appraised as amenable to change (Folkman & Lazarus, 1980, 1985; Folkman, Lazarus, Dunkel-Schetter, et al., 1986). It has been demonstrated that men utilised problem-focused coping strategies to a greater extent than women (Ptacek et al., 1992), although Folkman and Lazarus (1980) found this to be true for the context of work stress, but not for stress relating to family or health.

Emotion-focused coping strategies have been shown to include avoidance, minimisation, distancing, selective attention, and searching for positive value in a negative event (Carver et al., 1989; Lazarus & Folkman, 1984). Emotion-focused coping strategies were likely to be employed when a situation was appraised as unchangeable (Folkman & Lazarus, 1980, 1985). Whereas one study

demonstrated women used more emotion-focused coping strategies than men (Ptacek et al., 1992), another indicated no differences between the sexes (Folkman & Lazarus, 1980). Explanations for this inconsistency were not clear, although the different samples (college students versus married couples) may be a reason. In a review of relevant literature, Greenglass (1995) concluded that men and women do differ in the coping strategies they utilise. She suggested that the differences resulted from an unequal distribution of power and control, stereotypes and occupational gender segregation.

Importantly, empirical evidence has supported the distinction between problem-focused and emotion-focused coping strategies (Carver et al., 1989; Dewe, 1991b, 1992; Folkman & Lazarus, 1980, 1985; Larsson et al., 1988; Ptacek et al., 1992; Shinn et al., 1984). In a study of coping in a middle-aged sample, it was demonstrated that both problem- and emotion-focused coping were employed in response to nearly every stressful encounter reported (Folkman & Lazarus, 1980). In another study, it was demonstrated that at the various stages of an examination period, over 93% of students reported using both problem- and emotion-focused coping strategies (Folkman & Lazarus, 1985). Thus, when measuring coping processes, it is not merely a matter of addressing defensive processes or problem-solving, but "a complex process involving both the problem-solving and emotion-regulating functions" (Folkman & Lazarus, 1980, p. 227).

In specific situations, coping effectiveness has been postulated to be based on both the regulation of distress and the management of the problem causing distress (Lazarus & Folkman, 1984). Thus, a person who managed a problem effectively but at great emotional cost could not be said to be coping effectively. Similarly, a person who regulated their emotions successfully but did not deal with the source of the problem could not be seen as coping effectively. For example, evidence indicated that some people consumed alcohol to reduce

emotional distress (Cooper, Russell, Skinner, Frone & Mudar, 1992; Evans & Dunn, 1995; Lammers, Schippers & van der Staak, 1995; Peirce, Frone, Russell & Cooper, 1994; Wagner, 1993). However, research has demonstrated that those who used alcohol as a coping strategy also utilised significantly fewer problem-focused strategies (Breslin, O'Keeffe, Burrell, Ratliff-Crain & Baum, 1995). Therefore, alcohol has been utilised as a coping strategy in order to protect one's emotions, but evidence suggested that it may impede dealing with the problem.

Research has indicated that the use of coping strategies such as logical analysis, cognitive redefinition, information seeking, problem-solving action, and affective regulation has been positively related to some indexes of adaptation (Moos & Billings, 1982). The effectiveness of individual coping strategies has been explored in a sample of married couples (Folkman, Lazarus, Dunkel-Schetter, et al., 1986). This study demonstrated that stressful encounters ending with a satisfactory outcome, as rated by the participants, were characterised by the use of planful problem-solving and positive reappraisal. Stressful events with unsatisfactory outcomes were characterised by the use of confrontative coping and distancing. It has been contended that the coping responses of focusing on and venting emotions, behavioural disengagement and mental disengagement were less useful and may be dysfunctional (Carver et al., 1989).

A varied repertoire of coping responses has been demonstrated to be more effective than reliance on a single response (Broda, 1994; Pearlin & Schooler, 1978). For example, when participants reported the ways in which they coped with the stress arising from their marriage, parenting and household economics, results demonstrated that lower perceived stress was associated with a greater number of coping strategies utilised (Pearlin & Schooler, 1978). However, when these same individuals indicated how they coped with stress at work, this pattern was not demonstrated. It would appear that factors other than the number of coping strategies utilised were important when coping with occupational stress.

The overall pattern of results in this study did, however, demonstrate that a varied repertoire of coping strategies was more effective in alleviating stress than the reliance on any single strategy.

In a study of married couples, it was demonstrated that the more severe the problem, the more likely participants were to use a number of different coping strategies (Schwartz & Stone, 1993). In particular, participants reported seeking social support, expressing emotions and using relaxation.

Other research has demonstrated that adaptation to chronic illness can be enhanced by emphasising coping strategies (Broda, 1994). Chronically ill people who employed a wide variety of coping strategies had an advantage in coping with stressful life events. Those who had a limited repertoire of coping strategies appeared to experience life event stress more adversely than those who had a number of coping strategies available.

The consistency of individuals implementing various coping strategies to deal with stressful encounters has received attention. Research using married couples has demonstrated intra-individual consistency for coping strategies to range from .17 (seeking social support) to .47 (positive reappraisal) (Folkman, Lazarus, Gruen & DeLongis, 1986). Research using a similar sample in a longitudinal study, in which data were collected over several months, has demonstrated that direct action was used approximately 50% of the time (Schwartz & Stone, 1993). Strategies such as disengagement, positive reinterpretation, expressing emotions and acceptance were employed about 25% of the time. Social support was used relatively infrequently, and religion was rarely utilised. Although this study did not analyse the data from an intra-individual perspective, the longitudinal design established consistency in the use of some strategies, and in the nonuse of other strategies.

Another study, using a community sample, demonstrated that 5% of the sample were highly consistent in their use of coping strategies, despite the fact

that different problem situations were being faced (Folkman & Lazarus, 1980). This result was interpreted by the authors as suggesting a personality factor or trait was responsible for this consistency. However, most of the participants were inconsistent in their use of coping strategies, and the coping patterns generally demonstrated were not predicted by person factors or predicted entirely by situation factors.

A longitudinal study of coping in a community sample of men and women demonstrated modest stability in participants' use of particular coping strategies, suggesting that coping responses were, in part, a function of enduring characteristics of participants (McCrae, 1989). Significant correlations between sampling times were demonstrated for the following coping behaviours: hostile reaction, rational action, seeking help, fatalism, expression of feelings, positive thinking, escapist fantasy, intellectual denial, self-blame, sedation, substitution, restraint, drawing strength from adversity, avoidance, withdrawal, self-adaptation, wishful thinking, humour, passivity, indecisiveness, faith and active forgetting. The results from this study also demonstrated that the way people cope does not change predicably with age.

It was evident, therefore, that inconsistencies existed when the literature, which concerned intra-individual consistency in the use of coping strategies, was examined. Whereas the samples utilised in the different studies may be a source of these differing results, it also may be the nature of the situations which were rated by the participants. The research reviewed does not document the encounters rated by participants. There was, consequently, no way of knowing how similar encounters were between participants and within particular studies.

A further limitation of the studies demonstrating consistency in coping strategies utilised (Folkman & Lazarus, 1980; Folkman, Lazarus, Gruen & DeLongis, 1986; Schwartz & Stone, 1993) was the difficulty in establishing how individuals coped with specific encounters. It has been noted that Lazarus and

Folkman (1984) contended that in order to understand how one coped with an encounter, the context of the coping must be known. Thus, the encounters which participants were referring to when completing questionnaires should be documented in research.

5.2.3 Relationship between cognitive appraisal and coping

Within the transactional model of stress, research has examined the relationship between appraisal of encounters and the coping strategies employed to deal with encounters (Folkman & Lazarus, 1985; Folkman, Lazarus, Dunkel-Schetter, et al., 1986). In relation to examinations, threat appraisals were positively associated with wishful thinking, what was at stake in the encounter, the anticipated difficulty of the exam and seeking social support (Folkman & Lazarus, 1985). Challenge appraisals were positively associated with feeling in control, the use of problem-focused coping strategies, what was at stake in the exam and wishful thinking. Challenge appraisals were negatively associated with self-isolation. Harm appraisals were positively associated with self-blame and wishful thinking, and negatively associated with grade on the exam. Benefit appraisals were positively associated with grade on the exam, seeking social support and the stakes involved. It was evident from this study, that each appraisal was differentially associated with the variables present in an encounter.

Other research has demonstrated the relationship between cognitive appraisal and coping (Folkman, Lazarus, Dunkel-Schetter, et al., 1986). This study of married couples demonstrated that when a situation was appraised as having threatened self-esteem, participants employed more confrontative, self-control and escape-avoidance coping, accepted more responsibility and sought less social support than during situations appraised as low in threat to self-esteem. Threat to a loved one's well-being was associated with the use of confrontative

and escape-avoidance coping, and less use of planful problem-solving and distancing. Results also indicated that situations involving goals at work were associated with self-control and planful problem-solving.

Secondary appraisals in this study (Folkman, Lazarus, Dunkel-Schetter, et al., 1986) also were associated with various coping strategies. When situations were appraised as changeable, participants accepted more responsibility, and utilised more confrontative coping, planful problem-solving and positive reappraisal than in situations appraised as not amenable to change. When situations had to be accepted, the couples used more distancing and escape-avoidance coping. In situations appraised as needing more information before acting, participants employed more social support, self-control and planful problem-solving. Finally, participants reported using more confrontative, self-control and escape-avoidance coping when they felt the need to hold back from doing what they wanted.

5.3 Occupational stress: Appraisal and coping

It has been observed that most of the occupational stress research that has been conducted so far has relied on stimulus-response definitions, rather than exploring the transactional model (Dewe, 1991b). Dewe (1991b, p. 332) concluded that "work-related stress research has failed, somewhat unintentionally, to benefit from the fact that transactional definitions of stress point to two mediational processes that are crucial to developing any understanding of the stress process...". The two processes were cognitive appraisal and coping. The failure of stress researchers to adopt the transactional stress model has resulted in a failure to address the appraisal process (Dewe, 1992).

The importance of cognitive appraisal in the occupational stress process has been alluded to (Mayes et al., 1991). It was suggested that future research could

focus on the employee's interpretation of work stressors. It was highlighted that not all participants viewed work situations negatively, as has previously been suggested to be the case. In explaining this difference, it was suggested that some participants took the view that the so-called stressful situation was an opportunity rather than a threat. In their review of stress research, Brief and Atieh (1987) noted the need for researchers to examine how employees themselves labelled their work conditions, rather than researchers labelling what was stressful and what was not stressful.

Using a sample of 144 workers from an insurance office, three categories of primary appraisal were demonstrated in response to the most stressful event that had occurred in the last month (Dewe, 1992). Forty two percent of participants were concerned with how the situation made them feel, including feeling uncomfortable, embarrassed, responsible for the situation or personally concerned about their own expectations. Approximately 33% of participants made reference to a lack of support, while 25% described a lack of control in the situation. Three options were identified in this study with regard to secondary appraisal of the stressful event. Over 55% of participants made reference to feeling constrained from acting; approximately 32% accepted the situation or got used to it; and 13% felt the situation was amenable to change. Further analyses demonstrated a relationship between primary and secondary appraisal, and coping with the stressful event. For example, stressors appraised in terms of a lack of support resulted in problem- and emotion-focused coping strategies being utilised more often than stressors appraised in other ways. Secondary appraisal was related to both the stressor and primary appraisal of the stressor. Lastly, results demonstrated that irrespective of appraisal, stressors themselves influenced the extent to which coping strategies were employed. It was concluded that there was tentative support for the relationship between primary and secondary appraisal and the ways in which individuals subsequently coped with work stressors.

Using the same sample of insurance office workers, Dewe (1991b) explored the relationship between cognitive appraisal and coping in an occupational setting. Results demonstrated that the dependent variable of tension was predominantly predicted by primary appraisal, as opposed to secondary appraisal or coping. When constraint was entered as the dependent variable, both types of appraisal had significant predictive power, but coping did not. Further regression analyses in this study demonstrated similar results. It was clear that primary appraisal was the most significant predictor of the dependent variables of tension and constraint. Tentative support was demonstrated for the mediating role of secondary appraisal in response to work situations. On the basis of these results, Dewe concluded that the appraisal process was crucial to the understanding of coping, and that the role of attributing meaning to work events must be measured in future research.

Other research has not supported the mediating role of secondary appraisal in the stress process (Thornton, 1992). This study of stress in mental health workers investigated the mediating role of secondary appraisal in the relationship between coping and burnout. However, the regression analysis was not significant, suggesting that secondary appraisal did not mediate the relationship. It was concluded that, in relation to burnout, it did not matter if employees believed they could change the encounter through their individual coping efforts. Secondary appraisal also has been demonstrated as not mediating the relationship between coping and emotion (Folkman & Lazarus, 1988).

Research, comparing the appraisal and coping processes of teachers reporting mild, moderate and severe levels of stress, demonstrated that the groups did indeed differ in their appraisal and coping processes (Gadzella et al., 1991). For example, those teachers reporting severe levels of stress reported using significantly more hostility, and were becoming more impatient, depressed and withdrawn than other participants in the study. However, the contribution of this

study to the appraisal literature was limited as it did not assess appraisal in terms of primary and secondary appraisal, nor did it examine specific appraisals such as threat and challenge.

As noted previously, most researchers have failed to measure cognitive appraisal in occupational stress research (Dewe, 1991b). Instead, the focus has been on the coping strategies utilised to deal with occupational stress (Gadzella et al., 1991; Israel, House, Schurman, Heaney & Mero, 1989; Schwartz & Stone, 1993; Shinn et al., 1984; Stern, Norman & Komm, 1993). Results of these studies established that workers employed a multitude of coping strategies to deal with work stress. For human service workers, the most commonly used coping strategy involved focusing attention on family and friends or on hobbies (Shinn et al., 1984). Indeed, 64% of participants reported using this strategy. One third of the sample reported "building competence", through attending workshops and conferences, as a way of dealing with stress at work. A similar proportion of the sample reported using the strategies of changing their approach to the job, taking vacations and using cognitive or emotional strategies, such as self-blame, anger or positive reinterpretation, when dealing with stress.

Other research has indicated that employees took direct action to deal with problems at work, but did not use religion to assist in such situations (Schwartz & Stone, 1993). The ways in which 630 employees of a components-parts manufacturing plant coped with work stress had significant relationships with job strain and depression (Israel et al., 1989). For example, 'getting down on oneself or others' and poor health behaviours, such as drinking and smoking, were associated with more adverse outcomes. The strategy of 'talking about problems' was associated with both increased depression and greater job satisfaction. This apparently conflicting result highlighted the complexities involved in the stress process. It may be that discussing problems led to a realisation of the situation, and, therefore, higher scores of depression, but at the same time the opportunity to

express concerns regarding difficulties led to a greater satisfaction with work. Talking over problems has been reported to be a facet of social support, and, as will become apparent in the next section of this chapter, social support has been related to positive outcomes for employees.

Research on coping strategies of 104 executive women demonstrated that the use of humour moderated the impact of daily hassles on self-esteem, burnout and physical health (Fry, 1995). Further, high levels of humour were associated with the use of coping strategies that relied on social support. Mental health professionals (n = 234) completed a series of questionnaires measuring coping and burnout (Thornton, 1992). They reported using planful problem-solving more frequently than other coping strategies. These employees utilised social support, self-control, confrontative coping and positive reappraisal equally, whereas distancing, accepting responsibility and escape-avoidance strategies were used less often. It was demonstrated that the frequency of use of all coping strategies was evenly distributed across levels of burnout symptoms, except for the use of escape-avoidance coping, which was utilised more often by those with high levels of burnout.

A study of coping strategies utilised by 102 medical students demonstrated that problem-solving was employed most frequently, followed closely by seeking social support and self-blame (Stern et al., 1993). The students were least likely to use escape-avoidance coping strategies. This research also highlighted the importance of the situation appraised as stressful. For example, the students used self-blame and problem-solving strategies more often when dealing with medical school stressors. However, they utilised confrontative coping strategies when dealing with interpersonal stressors. This was one of the few studies that had investigated the nature of coping in response to specific contexts.

Some stress researchers have demonstrated differences between how people coped with work situations and how they coped with nonwork situations

(Folkman & Lazarus, 1980; Pearlin & Schooler, 1978; Schwartz & Stone, 1993). In a study using a community sample, it was established that the context of a stressful situation was important in determining the ways in which people coped with that situation (Folkman & Lazarus, 1980). Work-related stressors were dealt with by utilising more problem-focused strategies, while health-related issues were dealt with by using more emotion-focused coping strategies. These results were in contrast to an earlier study which demonstrated that coping strategies directed at changing situations at work were infrequently employed (Pearlin & Schooler, 1978). It was difficult to give a definitive explanation for this inconsistency, but it may be due to the nature of the work situations involved. However, as these studies have not provided clear details as to what the participants were referring to when completing the coping scales, this explanation is speculative.

More recently, Schwartz and Stone (1993) investigated the coping strategies utilised by a community sample of 42 working adults. The participants were involved in an intensive longitudinal study in which they completed questionnaires in relation to the day's most stressful encounter. Coping with work stressors was compared to coping with nonwork stressors. Results indicated that coping strategies such as disengagement, religion and relaxation were used considerably less in response to work stressors when compared to nonwork stressors. Coping strategies that were action directed and involved acceptance were used more in response to work stressors. Thus, there was evidence to suggest that individuals utilised different coping strategies when dealing with work and nonwork encounters. The context in which one was coping, therefore, was important.

Empirical evidence suggested that some coping strategies appeared to be ineffective in ameliorating the effects of work stress (Pearlin & Schooler, 1978; Shinn et al., 1984). Using a sample of human service workers, it was

demonstrated that individual coping strategies, such as focusing attention on family and friends rather than work, were largely ineffective, but higher levels of coping, and especially social support, were related to reduced strain (Shinn et al., 1984). It was concluded from this study that individual coping efforts did not have a significant impact in work situations, whereas social support had a main role to play in ameliorating the negative effects of work stress.

5.4 Coping resources

In addition to utilising specific coping strategies in a stressful situation, research suggested that individuals also possessed coping resources. Coping resources have been defined as "relatively stable dispositional characteristics that affect the coping process" (Moos & Billings, 1982, p. 215). Personal coping resources were seen to be inherent in an individual, and assisted in combating the effects of stress (Israel et al., 1989; Shaw, Fields, Thacker & Fisher, 1993). Research has indicated that psychological resources, including self-esteem, functioned by enhancing the social resources available to people with which to combat psychological distress (Ensel & Lin, 1991). Research has demonstrated that the lack of the personal resources of mastery and self-esteem were related to the experience of depression by workers from a manufacturing plant (Israel et al., 1989). A recent survey of Australian lawyers (Callan, Terry & Schweitzer, 1994) indicated that greater self-confidence and internality of control beliefs were directly related to lower levels of anxiety. Further, lower depression levels were associated with the increased use of personal resources. American chief executive officers (n = 235) completed a survey on coping resources and stress (Begley & Boyd, 1992). Results showed that two psychological resources, higher mastery and firmly-held religious beliefs, were related to the experience of lower perceived stress.

Coping resources also have been postulated to be external to the individual. In an occupational setting such resources included socio-emotional support, availability of information, tangible forms of aid and support from supervisors (Shaw et al., 1993). Research on stress in 110 telephone and telegraph employees, experiencing major organisational change, demonstrated that external coping resources had a direct impact on three measures of job strain, namely job satisfaction, commitment to the organisation and attitudes to the breakdown of the organisation (Shaw et al., 1993).

Social support has been the most frequently investigated external coping resource (e.g., Bartone, Ursano, Wright & Ingram, 1989; Boumans & Landeweerd, 1992; Cummins, 1988; Daniels & Guppy, 1994; DeLongis, Folkman & Lazarus, 1988; Dunkel-Schetter, Folkman & Lazarus, 1987; Ensel & Lin, 1991; Florence, Lutzen & Alexius, 1994; Hobfell & Lerman, 1988; Hockenberry, Kemp & DiIorio, 1994; Jayarante et al., 1988; Koeske & Kelly, 1995; LaRocco, House & French, 1980; Morrison et al., 1992; Pearlin, Lieberman, Menaghan & Mullan, 1981; Sarason, Levine, Basham & Sarason, 1983; Shaw et al., 1993; Shinn et al., 1984; Tetzloff & Barrera, 1987; Veiel, 1987; Warren & Cockerill, 1991; Yang & Carayon, 1995). This body of research generally supported the notion that social support had either a direct or indirect (buffering) effect on psychological distress.

In the general stress literature, the positive effects of social support have been demonstrated for mothers of ill children (Hobfell & Lerman, 1988), children with cancer (Hockenberry et al., 1994), caregivers of family members with dementia (Cox, 1995; McNaughton, Patterson, Smith & Grant, 1995; Uchino, Kiecolt-Glaser & Cacioppo, 1992), men (Nott & Vedhara, 1995) and women (Florence et al., 1994) who were HIV-positive, depressed patients (Sherbourne, Hays & Wells, 1995), people with diabetes mellitus (Krause, 1995), Tiawanese homemakers (Lu, 1995), immigrants (Cheung & Spears, 1995), the elderly

(Hogan & Eggebeen, 1995; Preston, 1995), mothers with young children (Gottlieb & Mendelson, 1995), divorced women with children (Duffy, 1995), adolescent mothers (Richardson, Barbour & Bubenzer, 1995) and battered women (Kemp, Green, Hovanitz & Rawlings, 1995). A longitudinal study of a community sample demonstrated the ability of social resources to protect participants against psychological distress, which was measured 2 and 3 years later (Ensel & Lin, 1991). Thus, evidence has supported the enduring nature of social support systems.

Research also has established the positive effect social support had on coping with occupational stress. For example, social workers who used existing social support systems within their organisation reported benefiting from this, although the use of social support did not guarantee positive outcomes (Jayarante et al., 1988). Furthermore, it was demonstrated that workers were more likely to use social support systems if they perceived the work organisation to be supportive. A study of stress in office workers indicated that supervisor support was associated with a greater reduction of worker stress than support from co-workers (Yang & Carayon, 1995). Research of workers from several occupations indicated that workplace social support was more effective for men than women (Geller & Hobfoll, 1994).

Other research has demonstrated the protective function of social support for workers who assisted at the scene of a military air disaster (Bartone et al., 1989), counsellors and psychologists (Huebner, 1994; Schauben & Frazier, 1995; Sowa, May & Niles, 1994), officers in the armed forces (Etzion & Westman, 1994), health professionals (Bennett, Kelaher & Ross, 1994; Ellis & Miller, 1994), childcare workers (Manlove, 1994) and police officers (Evans et al., 1993; Graf, 1986; Kirkcaldy, Cooper, Eysenck & Brown, 1994). Social support has been shown to be ineffective, however, in dealing with the stress of job insecurity (Dekker & Schaufeli, 1995). This study of 32 employees from an Australian

public transport organisation reported that social support from colleagues, management and the unions was not effective in reducing the negative effects of job insecurity. The nature of the stressor, particularly the uncertainty associated with it, was given as the explanation for this result. It was suggested that the stressor itself had to be dealt with in order to reduce the stress experienced by the employees.

In summary, evidence suggested that there were a variety of coping resources, some of which were inherent and some of which were external to the individual. Research has established the positive impact coping resources have in assisting individuals to combat the negative effects of stress (Zeider & Hammer, 1990). The quantity and quality of external resources available to workers may be particularly important given that individual coping strategies were demonstrated to be ineffective in ameliorating the effects of work stress (Pearlin & Schooler, 1978; Shinn et al., 1984). It would appear, therefore, important to examine the coping resources available to police officers.

Inspection of the literature indicated that this area of research had received little attention from police stress researchers. Social support has been investigated by several researchers (Elliott et al., 1986; Fusilier et al., 1987; Graf, 1986; Kaufmann & Beehr, 1989; Kirmeyer & Dougherty, 1988). Research has demonstrated that police officers who identified greater numbers of persons from whom support was attainable perceived their work to be less stressful than officers who identified fewer supports (Graf, 1986). Other research has indicated positive effects of social support on depression and somatic complaints (Fusilier et al., 1987) and on measures of psychological strain (Kaufmann & Beehr, 1989). However, other research did not demonstrate that marital intimacy mediated the impact of stress on police officers (Elliott et al., 1986). Additional coping resources, whether inherent or external, have not been investigated in police stress research. Given the positive impact that coping resources have had on other

employees, it was apparent that researchers needed to investigate the coping resources available to police officers to draw upon when dealing with occupational stress.

5.5 Police research

Some researchers of police stress have examined the coping behaviours of police officers (e.g., Beehr, Johnson & Nieva, 1995; Brown et al., 1996; Burke, 1993b; Cooper et al., 1994; Elliott et al., 1986; Fain & McCormick, 1988; Graf, 1986; Holaday et al., 1995; Kirkcaldy et al., 1993; Maynard, Maynard, McCubbin & Shao, 1980; McCammon et al., 1988; Violanti & Marshall, 1983; Wearing & Hart, 1996). Approximately 23% of the studies listed in Table 1 have examined this aspect of the police stress process. Cognitive appraisal has been clearly neglected in police stress research, with just three studies (Kirmeyer & Diamond, 1985; Larsson et al., 1988; Wearing & Hart, 1996) investigating this aspect of the stress process.

Larsson et al. (1988) investigated the cognitive appraisal processes of Swedish police officers. The police officers perceived considerably more challenge than threat in work situations. The police officers tended not to appraise situations as benign-positive, and to an even lesser extent, as irrelevant. In relation to secondary appraisal, work situations were seen as having to be accepted and as resolvable. Consistency of appraisals were calculated across work situations for participants, and scores ranged from 0.40 to 1.00, with a mean of 0.70. Thus, a reasonable degree of consistency was evident when police officers appraised a variety of work situations. This research did not, however, document the appraisals of specific work encounters.

Kirmeyer and Diamond (1985) investigated police officers' secondary appraisals of work situations. The 31 radio dispatch officers were interviewed

about a recent stressful work event, and then completed a secondary appraisal scale in relation to the stressor. Results indicated that 55% of the police officers appraised the situation as having to be accepted and 13% as being amenable to change. Primary appraisal was not investigated in this study, so little light was shed on this aspect of the police stress process. This was significant, given that Dewe (1991b) later documented the importance of primary appraisal in the stress process. Additionally, although the authors collected data on the stressors reported by the police officers, analyses were not conducted to demonstrate how specific encounters were appraised.

As noted, another study also has documented the cognitive appraisal processes of police officers (Wearing & Hart, 1996). This study focused on the reappraisal of situations, following the implementation of coping strategies in response to the initial appraisal. Results indicated that the personality of the police officer, the domain under examination (work or home) and the coping strategies utilised, all made independent contributions to the reappraisal of situations.

Much of the research on police stress has examined the methods of coping by police officers. It has been contended that there were two specific coping strategies believed to be salient in police work: cynicism and deviance (Violanti & Marshall, 1983). As coping strategies, cynicism and deviance were utilised in an attempt to lessen stress by psychologically and behaviourally adjusting to the strain of work demands. Cynicism has been described as a "mocking disbelief of people and the police system" (Neiderhoffer, 1976, p. 107). Cynicism was regarded as a coping strategy because it allowed the police officer to discount work demands by disbelieving them. Police deviance was seen to be manifested in the violation of laws by police officers. It has been argued that police deviance was occupationally based in that it emerged within the context of everyday police functions (Violanti & Marshall, 1983). Furthermore, deviance has been regarded

as salient in police work because officers had ample opportunity to stray from norms and were influenced by strong peer pressure (Bryant, 1974). As a coping behaviour deviance became an expression of the police officer's will, and it reflected overt behaviour aimed at weakening the strong influence of occupational demands. Using a sample of 500 American police officers, it was determined that cynicism and deviance were indeed used as coping responses to police stressors (Violanti & Marshall, 1983). Significantly, it appeared that these coping strategies increased stress, rather than decreased stress. One criticism of this research concerned the extremely limited nature of the coping strategies investigated. The researchers failed to examine those strategies that may have been adaptive.

Researchers have documented other ways in which police officers reported coping with occupational stress. A number of authors proposed that among police officers, alcohol was very much accepted as a way of coping with the tensions and stressors of the day (Beutler et al., 1988; Farkas, 1986; Kroes, 1985; Maynard & Maynard, 1982; Pendergrass & Ostrove, 1986; Smith & de Chesnay, 1994; Violanti et al., 1983, 1985). On the basis of path analysis, it was demonstrated that the failure of coping strategies such as deviance and cynicism led to increased stress, and both of these increased the use of alcohol (Violanti et al., 1985). For police officers, alcohol use appeared to be the most convenient and socially accepted coping alternative.

More recently, the use of both "adaptive" and "maladaptive" coping mechanisms by police officers was examined (Fain & McCormick, 1988). However, the results were discussed in terms of differences between deputies who worked in rural settings and police officers who worked in a municipal community. Thus, little light was shed on the use of coping strategies by police officers. Two limitations were highlighted in this research. The researchers assumed that all police officers were under some degree of stress, so the nature

and extent of stress was not determined. Thus, it was impossible to differentiate between police officers who were using different coping strategies and who, consequently, may have exhibited different levels of stress. The researchers also failed to go beyond the two group categorisation of coping strategies, thus ignoring the role of individual coping strategies in the stress process. From this study, therefore, it was impossible to determine which specific coping strategies were associated with an increased or decreased stress.

McLaren (1990) attempted to address this limitation in a study of Tasmanian police officers. Results demonstrated weak negative correlations between perceived stress and the theoretically adaptive coping strategies (Carver et al., 1989) of active coping, planning, seeking instrumental social support and positive reinterpretation and growth. That is, the use of coping strategies involving seeking advice, planning and taking action to circumvent the stressor, and viewing the stressor in a more favourable light, were slightly associated with lower perceived stress. The study also demonstrated a significant positive relationship between the use of theoretically questionable coping strategies (Carver et al., 1989) and perceived stress level. In particular, increased use of denial, focusing on and venting emotions, behavioural and mental disengagement and alcohol was associated with higher reported stress. It would appear, then, that higher levels of stress in these police officers were related to a greater use of coping strategies that enabled one to mentally and physically avoid the stressor and associated stress.

Another Australian study (Hart et al., 1995) demonstrated that police officers employed both problem- and emotion-focused coping strategies when dealing with occupational stress. Further, analyses indicated that emotion-focused coping strategies were associated with increased reports of stress, whereas the use of problem-focused coping strategies were associated with lower

levels of stress. Thus, in this study, emotion-focused coping strategies were seen as maladaptive and problem-focused coping strategies were seen as adaptive.

Other research has documented the coping strategies utilised by police officers (Alexander & Walker, 1994; Brown et al., 1996; Evans et al., 1993; Kirkcaldy, Cooper, Eysenck & Brown, 1994; Larsson et al., 1988). It was demonstrated in one study that talking to other police officers was the most frequently employed coping strategy while on duty (Alexander & Walker, 1994). There also was a tendency for officers to work harder when under stress. Alcohol was used by a small portion of the sample. Only 27% of the sample viewed the strategies utilised to cope with work as "very effective" or "completely effective". It was evident that the police officers continued to utilised particular coping strategies despite reporting the relative ineffectiveness of such strategies when dealing with work stress.

Larsson and colleagues (1988) demonstrated that problem- and emotion-focused coping strategies were employed by police officers in nearly all stressful encounters. "Keep your mind on the task-avoid thinking about other things" typified the cognitive coping strategy of these police officers. Emotion-focused coping strategies such as self-blame, tension reduction, escape-avoidance coping, and seeking emotional social support were virtually never used during stressful encounters.

Recent research on 533 senior police officers in the United Kingdom utilised the Occupational Stress Indicator to establish the ways in which these officers coped with occupational stress (Brown et al., 1996; Kirkcaldy, Cooper, Eysenck & Brown, 1994). The police officers reported utilising social support provided through stable relationships, and the problem-focused coping strategies of planning ahead and taking direct action, to deal with problems (Kirkcaldy, Cooper, Eysenck & Brown, 1994). The strategies of planning ahead, dealing with problems immediately and objectively, setting priorities and having stable

relationships were employed by 90% of the sample (Brown et al., 1996). Avoidance was used by less than 20% of the police officers. It was noted by the authors of both studies, however, that the coping subscale of the Occupational Stress Indicator had relatively weak internal reliability. These studies, however, gave an indication of how senior police officers generally coped with occupational stress.

An Australian survey (Evans et al., 1993), of 271 police officers, employed a modified Ways of Coping Checklist to document the coping strategies utilised by officers when dealing with work stressors. The police officers surveyed used problem-focused coping strategies that were aimed at taking direct action to deal with stressors. They made plans, and worked through them one step at a time. Social support strategies also were used, with officers speaking to others to find out more about a situation, and talking to someone who could do something about the situation. It was contended that the use of these social support strategies were examples of direct action or problem-focused coping, rather than emotion-focused strategies. Indeed, the police officers did not talk to others about their feelings, and used avoidance strategies to achieve this. It was postulated that the police officers attempted to deal with their emotions through becoming depersonalised, an effective way of dealing with stress (Evans et al., 1993).

Other research (Holaday et al., 1995), investigating responses to a disaster, has indicated that police officers and firefighters used self-reinforcement and internal reminders that they were trained professionals significantly more than other groups of people. The police officers also reported shutting out their thoughts and feelings in response to the trauma.

In recent years, therefore, researchers have begun to address the issue of how police officers have coped with their work. It is evident that this research has focused on general coping, rather than on how police officers coped with specific aspects of their occupation. This was in contrast to the understanding of

coping as a process (Lazarus & Folkman, 1984). This perspective contended that the assessment of coping should be context specific, rather than general. Therefore, the research that has been conducted has not been within a transactional model of stress, and as a consequence, the other component of the theory, cognitive appraisal, has not been adequately addressed.

A recent study using Australian police officers (Wearing & Hart, 1996) tested assumptions of the transactional model of stress. Wearing and Hart contended that if the transactional model of stress was accurate, then the ways in which police officers coped with stress arising from work should be different to how they coped with stress arising from home life. The police officers in this study reported high levels of stability in their utilisation of problem- and emotion-focused coping strategies across the work and home domains. Such stability in using coping strategies did not support the transactional model of stress. However, Folkman, Lazarus, Gruen and DeLongis (1986) contended that, theoretically, some stability should be expected, since coping was based on stable personality traits, as well as the actual appraisal of the encounter (resulting in some instability).

Since the existing research on police stress has not been context specific, it has not been possible to address the issue of how police officers coped after a particular situation had ended. It has been commonly accepted that some work situations experienced by police officers have long-term effects, and this factor has been central to the routine utilisation of CISD procedures (Mitchell & Bray, 1989). Therefore, research which is not only situation specific, but also which considers the coping strategies that police employ after an incident had ended is warranted. The key issue concerns what was occurring cognitively, behaviourally and psychophysiologically once an officer had finished at the scene of a stressful event.

One study addressed the issue of how police officers generally coped with work-induced stress when off duty (Alexander & Walker, 1994). A frequently employed coping strategy involved "keeping things to themselves", although other police officers chose to talk to family and friends about their concerns. Alcohol was utilised as a means of coping, but seeking professional help and using prescribed medication for sleep difficulties were not commonly utilised. Interestingly, the overall effectiveness of the strategies used while off-duty were not rated as high, with only 31% of officers rating effectiveness as either "very effective" or "completely effective". However, as noted, this research was not situation specific, and there was no empirical evidence demonstrating how police officers coped after a specific situation had ended.

5.5.1 Factors influencing coping strategies utilised

It was evident in the review of literature concerning the antecedents and consequences of stress that the sex, age, rank, length of service and personality of police officers affected the level and type of stress experienced. These factors also appeared to influence the ways in which police officers coped with occupational stress.

As noted, the ways in which male and female police officers coped with the stress of their work has been demonstrated to differ (Alexander & Walker, 1994; Martin et al., 1986). While on duty, male police officers were more likely to vent their feelings on the general public, whereas female police officers were more likely to vent their feelings on their colleagues (Alexander & Walker, 1994). Once off duty, female police officers were more likely to eat less and to talk things over more frequently with family/friends than male officers. Male police officers have been demonstrated to consume alcohol significantly more than females (Pendergrass & Ostrove, 1986). Other research has demonstrated the

increased use of social support for female police officers, as well as actively trying to forget the sources of the experienced stress (Martin et al., 1986).

As previously indicated, age, rank and length of service have been demonstrated to be related to the way in which police officers coped with work situations (Alexander & Walker, 1994; Kaufmann & Beehr, 1989; Larsson et al., 1988). Research indicated that older police officers (40 years or more) used more planful problem-solving and sought more social support than younger police officers (29 years or less) (Larsson et al., 1988). Younger officers employed wishful thinking and anger-control more often.

Larsson et al. (1988) demonstrated the effects of rank on coping strategies utilised. Police officers in commander positions used more planful problem-solving and social support than police officers in the field. Police officers in the field utilised more anger-control and wishful thinking. Supervisors also have been shown to use more social support than police officers in nonsupervisory positions (Kaufmann & Beehr, 1989). Other research has indicated that sergeants delegated when under stress, whereas constables more often vented their emotions on the public (Alexander & Walker, 1994). When coping outside of work, constables tended to relax and not discuss their difficulties with their family or friends. Police officers of the rank of inspector or above talked more to their family and friends about difficulties compared to sergeants.

Limited research has indicated that the personality of police officers was related to the ways in which they cognitively appraised and coped with stressful work encounters (Kirmeyer & Diamond, 1985). In this study, American police officers were classified as having either Type A or Type B personality behaviour patterns, as indicated by the Jenkins Activity Survey. After completing appraisal and coping measures, it was evident that Type As used restraint more often, whereas the Type Bs accepted the encounters more often. When coping with occupational stress, the Type As employed more active problem-focused coping

strategies. This research did not investigate differences in primary appraisal of the work encounters. Whereas few differences between the two groups of police officers were demonstrated, it may be that the personality characteristics of police officers were factors influencing the interpretation of work situations and the coping strategies subsequently utilised.

5.6 Summary

One of the most influential models of stress, the transactional model, emphasised the roles of cognitive appraisal and coping in mediating encounters with the environment. Few studies of occupational stress, and just three studies of police stress, have employed this model. Considering that primary appraisal was the most predictive variable of occupational tension and constraint (Dewe, 1991b), it was proposed that this model should be used as the basis for investigating police stress. Although recent research has focused on the coping behaviours of police officers, this research has been general rather than context specific in its approach. Furthermore, little research has documented the coping strategies associated with decreased police stress, or how officers cope with situations after they had ended. Considering that stress in police work increased the need for effective coping (Violanti et al., 1985), it was evident that aspects of the coping process needed further investigation.

CHAPTER SIX

WORK STRESSORS: COGNITIVE APPRAISAL AND COPING

6. WORK STRESS: COGNITIVE APPRAISAL AND COPING

6.1 Introduction

The results of both Study One and previous research investigating sources of stress for Tasmanian police officers (McLaren, 1990), have indicated that three operational tasks were particularly stressful for these officers. The tasks identified were: attending the scene of a serious car accident, delivering a death notification and appearing in court as a witness. A review of the literature on police stress indicated that very few details have been documented regarding the nature of the stress associated with these tasks. Consequently, these work situations became the focus of Studies Two and Three.

The review of literature describing the transactional model of stress indicated the importance of two elements in the stress process: cognitive appraisal and coping. Thus, the ways in which police officers cognitively appraised and subsequently coped with the work situations were crucial in understanding the impact these situations had on the officers. Whereas the importance of cognitive appraisal has been accepted in the general stress literature (Croyle, 1992; Dewe, 1991b, 1992; Folkman, Lazarus, Dunkel-Schetter, et al., 1986; Folkman, Lazarus, Gruen & DeLongis, 1986; Gadzella et al., 1991; Larsson et al., 1988; Ptacek et al., 1992), investigators of occupational stress have failed to include this process in their research. This has been regarded as a limitation in occupational stress research conducted thus far (Dewe, 1992). Just three studies of police stress have investigated aspects of cognitive appraisal (Kirmeyer & Diamond, 1985; Larsson et al., 1988; Wearing & Hart, 1996). Only one of these studies (Larsson et al., 1988) has described primary appraisal, and no one has investigated how police officers appraised specific work situations.

The transactional model of stress also proposed that in order to understand how an individual coped with a situation, researchers must know what the individual was coping with. Thus, Lazarus and Folkman (1984) emphasised the importance of examining specific encounters and specific coping responses, rather than general coping behaviours. However, police stress researchers have not addressed the issue of specific incidents and coping. Instead, research has examined how police coped generally (e.g., Alexander & Walker, 1994; Evans et al., 1993; Fain & McCormick, 1988). Whereas one study of police stress and coping addressed the issue of groups of stressors (Larsson et al., 1988), the analyses of coping behaviours were averaged across the stressors. Consequently, no light was shed on the ways in which police officers coped with specific work situations.

The issue of how police coped with occupational stressors outside work also has been neglected, with just one study having examined this issue (Alexander & Walker, 1994). However, this study examined general coping behaviours of officers, rather than coping with specific events.

The issue of coping resources has not been adequately addressed in the police stress literature. Given that research has clearly demonstrated the positive effects coping resources can have on stress (e.g., Begley & Boyd, 1992; Callan et al., 1994; Israel et al., 1989; Shaw et al., 1993), and especially the role that social support plays in reducing occupational stress (Bartone et al., 1989; Bennett et al., 1994; Ellis & Miller, 1994; Etzion & Westman, 1994; Evans et al., 1993; Geller & Hobfoll, 1994; Huebner, 1994; Kirkcaldy, Cooper, Eysenck & Brown, 1994; Schauben & Frazier, 1995; Sowa et al., 1994; Yang & Carayon, 1995), it was important to investigate the personal coping resources possessed by police officers. Only social support has been investigated in previous studies of police coping (Elliott et al., 1986; Fusilier et al., 1987; Graf, 1986; Kaufmann & Beehr, 1989; Kirmeyer & Dougherty, 1988). Given that the stress of police work increased the

need for coping (Violanti et al., 1985), it was important to examine other coping resources available to police officers.

The aim of this study was to examine the ways in which police officers cognitively appraised and coped with three operational tasks, namely attending serious car accidents, delivering death notifications, and attending court as a witness. On the basis of the literature, the following predictions were made. It was hypothesised that the police officers would appraise the work situations as challenging rather than threatening. The situations also would be appraised as resolvable and as having to be accepted. Further, it was hypothesised that the police officers would employ more problem-focused coping strategies than emotion-focused and dysfunctional coping strategies both during and after each work situation. Finally, it was hypothesised that the police officers would be consistent in their appraisal of and coping with the work situations.

The police officers' appraisal processes and utilisation of coping strategies during and after a stressful court experience were compared to a control group which had experienced a stressful interview. While it was acknowledged that attending court and experiencing an interview were not the same, similarities were evident between the two situations. For example, in both situations there was something at stake for the participant. Police officers had to perform in court, or there were serious ramifications. For the control participants, in most cases there was a job at stake. The question answer format also was similar, as was the degree of known or expected questions and unknown or unexpected questions. It was predicted that there would be no differences between the police officers and the control group on appraisal and coping with the court/interview situation, nor on the quantity of coping resources available.

6.2.1 Participants

Twenty male police officers from a Tasmanian city police station participated in the study. The officers were employed in operational duties. The police participants had to have experienced, and have clear memory of, each of the work situations. A significant number of police officers volunteered to participate, but failed to meet the criteria in that they had not experienced all three work situations. As a consequence, it was not possible to include them in the study. A control group of 20 male, age-matched undergraduate students participated for course credit. The control participants had to have experienced, and have clear memory of, a stressful interview. The mean age of the police officers was 30.75 years (SD = 7.85) and the mean age of the controls was 29.75 years (SD = 7.43). The groups were comparable with regard to age, $F(1, 38) = 0.17$, $p > .05$. The police officers had been in the police force for a mean of 9.02 years (SD = 5.89), and had been at the current station for a mean of 3.50 years (SD = 3.10). Participation was voluntary and written informed consent was obtained. A copy of the consent form is presented in Appendix D.

6.2.2 Materials

Demographic data, including age, marital status, and years in the police force and in the current department, were collected on the same Background Information Sheet used in Study One.

The Coping Resources Inventory (Hammer, 1988) was used to assess the range of inherent and external coping resources available to each participant. The scale provided a total score, and scores for five subscales. The Cognitive subscale

measured positive feelings towards oneself and others and a general optimistic attitude. The Social subscale assessed the social support network of the individual. The Emotional subscale measured the individual's acceptance and expression of affect, behaviours which have been seen to reduce the long-term effects of stress. The Spiritual/Philosophical subscale measured religious, familial, cultural and personal philosophies, and assessed the extent to which an individual's thoughts and actions were influenced by a solid value base which assisted in coping with stress. The Physical subscale assessed the extent to which the individual engaged in health-promoting behaviour, as such behaviours have been demonstrated to reduce responses to stress and promote recovery from stress. Cronbach's alpha coefficients for internal consistency for each subscale were as follows: Cognitive .77; Social .79; Emotional .84; Spiritual/Philosophical .84, and Physical .71. The coefficient for the total scale was .91 (Hammer, 1988).

Two cognitive appraisal scales were used. Primary appraisal was assessed by having participants indicate on a 4 point Likert scale (0 = not at all; 3 = completely) the extent to which they felt each of 18 emotions during the actual work situations. Larsson et al. (1988) reported each emotion to load on one of the four primary appraisals, specifically threat, challenge, benign-positive or irrelevant. Lazarus et al. (1988) reported reliability coefficients for this method of assessing primary appraisal to range from .66 to .81. Folkman and Lazarus (1985) also have used this assessment method, and reported reliability coefficients ranging from .59 to .84.

A scale measuring secondary appraisal was developed from the literature. Four options were included in the study: the situation was one that you could change or do something about; you had to accept; you needed to know more before you could act (Folkman & Lazarus, 1980); and you could reasonably resolve with the available resources (Larsson et al., 1988). Secondary appraisal was assessed

by participants rating on a four point Likert scale (0 = did not apply; 4 = applied a great deal) the degree to which each of the four appraisals applied to their situation.

The revised Ways of Coping (Folkman & Lazarus, 1985), modified by Larsson et al. (1988) to be more applicable to a police sample, was used to assess coping during each work situation. Thirty-five items constituted seven subscales: flexible confrontative problem-solving, planful problem-solving, seeking social support, positive reappraisal, self-control, anger-control and wishful thinking. Flexible problem-solving described adaptive social efforts to solve the problem. Planful problem-solving referred to deliberate problem-focused efforts to alter the situation. Seeking social support described efforts to seek informational and tangible social support. Self-control described efforts to regulate one's own thoughts and feelings, at the expense of dealing with the problem. Wishful thinking referred to using wishful thinking and risk-taking behaviour. Anger control described aggressive impulses and efforts to regulate them, especially at the expense of dealing with the problem. Positive reappraisal described efforts to keep up morale in the stressful encounter.

The participants rated, on a four point scale (0 = did not apply/did not use; 3 = used a great deal), the extent to which they utilised each coping strategy during the work situations. Although Larsson et al. (1988) did not report the reliabilities for the revised scale, the reliability coefficients reported by Folkman and Lazarus (1985) for similar factors were: problem-focused coping .85, wishful thinking .84, seeking social support .81, and positive reappraisal .65. The subscales were divided into the three groups of coping strategies identified by Carver et al. (1989). These three groups were problem-focused coping strategies (flexible confrontative problem-solving, planful problem-solving), emotion-focused coping strategies (seeking social support, positive reappraisal), and dysfunctional coping strategies (self-control, wishful thinking and anger-control). Dysfunctional coping strategies were regarded as such because they hampered the individual's attempt to deal with

the problem causing the distress (Folkman & Lazarus, 1985). The utilisation of such coping strategies has been linked to adjustment difficulties following stressful encounters (Carver et al., 1989).

The scale COPE (Carver et al., 1989) was used to assess coping after each work situation had ended. Sixty items constituted 15 subscales: active coping, planning, suppression of competing activities, restraint coping, instrumental social support, emotional social support, positive reinterpretation and growth, acceptance, turning to religion, focusing on and venting emotions, denial, behavioural disengagement, mental disengagement, use of alcohol and drugs and humour. Active coping described the process of taking direct action to circumvent the stressor or to ameliorate its effects. Planning referred to thinking about how to cope with the problem. Suppression of competing activities assessed the extent to which participants put aside other projects in order to focus on the stressor. Restraint coping referred to waiting until an appropriate opportunity to act presented itself. Instrumental social support described seeking advice, assistance or information, whereas emotional social support referred to seeking moral support, sympathy or understanding. Positive reinterpretation and growth described seeing positive light in the stressful encounter and attempting to draw something positive from the encounter. Acceptance referred to the individual recognising the reality of the situation, which then enabled them to deal with the encounter. Turning to religion assessed the extent to which the participants turned to God and prayer in response to the encounter. Focusing on and venting emotions referred to the tendency to focus on whatever emotions were being felt and to ventilate these emotions. Whereas this may be regarded as adaptive, this coping strategy has been shown to impede adjustment (Carver et al., 1989). Denial described the acceptance or refusal of the existence of a stressor. Behavioural disengagement described the reduction in one's efforts to deal with the stressor, by giving up the attempt to attain goals with which the stressor had been interfering. Mental disengagement referred

to the tasks one engaged in to avoid thinking about the stressor. The use of alcohol and drugs assessed the extent to which participants used alcohol and/or drugs to avoid thinking about the stressor. The humour subscale indexed the extent to which the participants utilised humour when dealing with the stressor.

Participants rated on a four point scale (1 = not at all; 4 = a lot) the extent to which they utilised each coping strategy after the work encounters had ended. Cronbach's alpha reliability coefficients for the subscales were: active coping .62, planning .80, suppression of competing activities .68, restraint coping .72, instrumental social support .75, emotional social support .85, positive reinterpretation and growth .68, acceptance .65, turning to religion .92, focusing on and venting emotions .77, denial .71, behavioural disengagement .63 and mental disengagement .45. Reliability coefficients for two factors, use of alcohol and drugs and humour, were not reported by Carver et al., but were included in the current study because the use of humour (Fry, 1995; McCrae, 1989) and alcohol (Breslin et al., 1995; Cooper et al., 1992; Evans & Dunn, 1995; Lammers et al., 1995; Peirce et al., 1994; Wagner, 1993) have been recognised as coping strategies in the literature. Additionally, past research indicated that some police officers consumed alcohol in an attempt to cope with work stress (Alexander & Walker, 1994; Kroes, 1985; Maynard & Maynard, 1982; McLaren, 1990; Violanti et al., 1985). Carver et al. grouped the subscales into three types of coping strategies: problem-focused (active coping, planning, suppression of competing activities, restraint coping, instrumental social support), emotion-focused (emotional social support, positive reinterpretation and growth, acceptance, religion, denial, humour) and dysfunctional (focusing on and venting emotions, mental disengagement, behavioural disengagement and use of alcohol and drugs).

Participants rated each work situation on three outcome dimensions: how well they perceived themselves to perform during the encounter (Larsson et al., 1988), and how well they perceived themselves to cope during and after each encounter.

Each dimension was measured using VASs, with scores ranging from 0 to 100. Higher scores on the three scales reflected greater satisfaction with performance and coping. The performance VAS was anchored with the words "Performed at my best" and "Performed at my worst". The two coping VASs were anchored with the words "Coped well" and "Coped poorly". As previously noted, VASs have been demonstrated to be highly sensitive and reliable, and suitable for frequent and repeated measurement for a within-subject design. In addition, they have been documented to be a psychometrically sound measure when used in a between-subjects design (McCormack et al., 1988).

Copies of the measures are included in Appendix E.

6.2.3 Procedure

Each police officer was interviewed individually at length and in depth about a stressful court experience, a serious car accident they had attended and a death notification they had delivered. The interviews were structured and covered receiving the death or car accident notification, or waiting to go into court, the approach to the actual incident, the incident itself, and leaving the location of the encounter. As much detail as possible was elicited from the police officer, including visual, auditory and psychophysiological memories of the particular event. The interviews were tape recorded for use in Study Three.

After each work situation was discussed, the participants completed the appraisal questionnaires, the Ways of Coping, in relation to the coping strategies utilised during the encounter, and the COPE, in relation to the coping strategies utilised after the encounter had ended. The participants then completed the three outcome items. At the end of the interview, the participants completed the Coping Resources Inventory.

The control group were interviewed about a stressful interview they had experienced. For most participants this was a job interview, but others related the experience of being interviewed by a school principal or by the police. This interview also was structured, following the same sequence as the court interview for the police officers. The control participants completed the same questionnaires as the police officers.

6.2.4 Design

A 2 x 2 factorial design was employed. This series of group (police officers, controls) x script (court, interview) designs were used with each of the cognitive appraisal, coping and outcome variables included in the study, specifically primary appraisal (irrelevant, benign-positive, threat, challenge), secondary appraisal (the situation was one that you could change or do something about; you had to accept; you needed to know more before you could act; you could reasonably resolve with the available resources), coping during (problem-focused coping strategies: flexible confrontative problem-solving, planful problem-solving; emotion-focused coping strategies: seeking social support, positive reappraisal; and dysfunctional coping strategies: self-control, wishful thinking and anger-control), coping after (problem-focused: active coping, planning, suppression of competing activities, restraint coping, instrumental social support; emotion-focused: emotional social support, positive reinterpretation and growth, acceptance, religion, denial, humour; and dysfunctional coping strategies: focussing on and venting emotions, mental disengagement, behavioural disengagement and use of alcohol and drugs) and outcome (quality of performance, satisfaction with coping during event, satisfaction with coping after event). Each of these designs facilitated the testing of differences between the police officers and the control group in their stressful experiences of appearing in court and attending an interview, respectively. Furthermore, for the

police officers, a within-subjects design was employed to test the differences between the three work situations on each of the variables previously noted.

6.2.5 Data analysis

A significance criterion of .05 was adopted for all analyses and a Huynh-Feldt correction was applied to all ANOVAs. All analyses were two-tailed. Separate ANOVAs were used to test for differences in the number of coping resources available to each group. Repeated-measures ANOVAs were employed to compare the police officers and the control participants on their experiences of a stressful court/interview encounter. Additional repeated-measures ANOVAs compared the three work situations for the police group only. Means comparisons, as calculated by SuperANOVA (Abacus Concepts, 1989), were employed to test for significant differences between the levels of variables in significant interactions and main effects. While the number of ANOVAs was large, the ratio of participants to dependent variables prevented the use of MANOVA (Tabachnick & Fidell, 1989).

In order to investigate the relationships between the cognitive appraisal, coping and outcome variables, intercorrelations were calculated and a matrix constructed, as documented previously by Lazarus and colleagues (Folkman & Lazarus, 1985, 1988; Folkman, Lazarus, Dunkel-Schetter, et al., 1986; Folkman, Lazarus, Gruen & DeLongis, 1986). All tests were two-tailed. Whereas previous research (Folkman & Lazarus, 1985, 1988; Folkman, Lazarus, Dunkel-Schetter, et al., 1986; Folkman, Lazarus, Gruen & DeLongis, 1986) had extended on the intercorrelations through the use of regression analyses, it was not possible to follow Lazarus' lead due to the small sample size (Tabachnick & Fidell, 1989). Whereas it is acknowledged that the calculation of a large number of correlations can lead to an increase in Type 1 errors, the alpha level was left at .05 due to the

exploratory nature of the research. Thus, those correlations significant at .05 may be interpreted with caution, and may be more appropriately described as trends. Consistent with Folkman, Lazarus, Gruen and DeLongis (1986), the stability of each primary and secondary appraisal and coping variable was established using mean correlations across the three work situations.

RESULTS

All ANOVAs were run using SuperANOVA (Abacus Concepts, 1989). Pearson correlation coefficients were calculated using StatView (Abacus Concepts, 1992).

6.3.1 Comparison of groups

Coping Resources

The means and standard deviations for the subscales and total score on the Coping Resources Inventory for both groups are presented in Table 4. Results demonstrated that the police officers had significantly fewer cognitive coping resources, $F(1, 38) = 4.16$, $p < .05$. The police officers also reported fewer emotional coping resources, $F(1, 38) = 4.00$, $p = .053$, and total number of coping resources available to them, $F(1, 38) = 3.83$, $p = .058$.

Primary Appraisal

Mean scores and standard deviations for the two groups for primary appraisal of the court/interview situation are displayed in Table 5. One group difference was demonstrated, with the police officers appraising the court situation as significantly more threatening than the control participants' appraisal of their interview, $F(1, 38) = 7.60$, $p < .009$.

Table 4. Means and standard deviations for the subscales and total score on the Coping Resources Inventory for both groups.

	Police	Controls
Cognitive		
M	24.15	27.30
SD	4.73	5.04
Social		
M	36.95	38.10
SD	5.29	6.50
Emotional		
M	38.70	43.35
SD	6.47	8.14
Spiritual		
M	24.85	27.10
SD	3.48	5.59
Physical		
M	27.45	29.70
SD	5.52	5.42
Total		
M	152.05	165.55
SD	20.67	22.89

Table 5. Mean scores and standard deviations for primary appraisal of each police work stressor and the controls' experience of a stressful interview.

Primary Appraisal		Acc	D.N.	Court	Interview
Irrelevant					
	M	1.15	1.00	0.85	0.55
	SD	1.09	1.08	0.93	0.89
Benign-Positive					
	M	1.02	0.80	0.80	0.81
	SD	0.76	0.54	0.45	0.68
Challenge					
	M	2.25	1.71	2.15	1.97
	SD	0.38	0.66	0.55	0.53
Threat					
	M	1.47	1.54	1.77	1.21
	SD	0.78	0.75	0.53	0.74

Note. Acc = accident; D.N. = death notification

Secondary Appraisal

The mean scores and standard deviations for the four secondary appraisal options are presented in Table 6. No significant differences were detected between the two groups.

Table 6. Mean scores and standard deviations for secondary appraisal of each police work stressor and the controls' experience of a stressful interview.

Secondary Appraisal	Acc	D.N.	Court	Interview
Could be changed				
M	0.70	0.35	1.25	0.85
SD	1.49	0.93	1.56	1.27
Had to accept				
M	3.55	3.45	3.20	3.40
SD	1.00	1.23	1.36	0.94
Needed to know more				
M	1.25	1.30	1.70	1.90
SD	1.33	1.59	1.66	1.90
Could resolve				
M	2.70	2.30	2.00	1.85
SD	1.56	1.72	1.59	1.50

Note. Acc = accident; D.N. = death notification

Coping During Court/Interview

The means and standard deviations for the two groups' use of coping strategies during the stressful encounter can be seen in Table 7. The police officers used significantly more coping strategies during their court situation than the controls used during their interview, $F(1, 38) = 5.37$, $p < .03$. Furthermore, the police employed more dysfunctional coping strategies, $F(1, 38) = 15.29$, $p < .001$, including anger-control, $F(1, 38) = 12.42$, $p < .002$, and self-control, $F(1, 38) = 15.94$, $p < .001$. The controls made significantly more use of social support, $F(1, 38) = 6.16$, $p < .02$.

Table 7. Mean scores and standard deviations for each coping strategy utilised during each police work stressor and the controls' experience of a stressful interview.

Coping Strategy	Acc	D.N.	Court	Interview
Problem-Focused				
M	0.95	1.12	1.46	1.39
SD	0.85	0.59	0.65	0.67
Flexible P.S.				
M	0.52	0.94	1.22	1.12
SD	0.38	0.57	0.63	0.71
Planful P.S.				
M	1.18	1.30	1.71	1.66
SD	0.75	0.75	0.78	0.71
Emotion-Focused				
M	1.23	0.94	1.30	1.05
SD	0.54	0.50	0.47	0.41
Social Support				
M	1.54	0.85	0.55	1.11
SD	0.73	0.71	0.80	0.62
Positive Reappraisal				
M	0.91	1.04	1.12	0.98
SD	0.62	0.62	0.57	0.68
Dysfunctional				
M	0.99	0.97	1.51	0.89
SD	0.47	0.40	0.56	0.44
Self-Control				
M	2.00	1.94	1.85	1.05
SD	0.73	0.70	0.65	0.62
Wishful Thinking				
M	0.49	0.58	1.09	0.95
SD	0.44	0.34	0.71	0.53
Anger-Control				
M	0.51	0.46	1.58	0.68
SD	0.58	0.53	0.89	0.71

Note. Acc = accident; D.N. = death notification; P.S. = problem-solving

Coping After Court/Interview

The mean usage and standard deviations of each coping strategy for both groups can be seen in Table 8. There were no significant differences between the two groups in their use of any of the coping strategies.

Table 8. Mean scores and standard deviations for each coping strategy utilised following each police work stressor and the controls' experience of a stressful interview.

Coping Strategy		Acc	D.N.	Court	Interview
Problem-Focused					
	M	1.54	1.51	1.70	1.80
	SD	0.46	0.38	0.48	0.52
Active Coping					
	M	6.80	6.15	6.65	7.00
	SD	2.35	1.93	3.03	2.47
Planning					
	M	6.00	6.25	7.90	7.45
	SD	2.94	2.22	3.29	2.28
Instrumental S.S.					
	M	6.65	6.20	8.05	8.05
	SD	2.87	2.04	3.17	3.10
Restraint Coping					
	M	4.95	5.05	5.45	6.80
	SD	1.57	1.91	2.21	2.65
Suppression					
	M	5.95	5.75	5.95	6.65
	SD	2.16	2.05	2.89	2.72
Emotion-Focused					
	M	1.92	1.89	2.07	1.94
	SD	0.29	0.29	0.46	0.47
Positive Reinterpretation					
	M	8.95	9.65	11.10	10.05
	SD	2.09	2.04	3.17	3.10
Acceptance					
	M	13.15	12.85	11.70	11.05
	SD	2.70	3.35	4.08	3.73
Humour					
	M	7.45	7.30	9.15	7.30
	SD	3.61	3.59	3.50	3.51
Religion					
	M	4.30	4.15	4.25	4.45
	SD	0.92	0.61	0.91	1.15
Emotional S.S.					
	M	6.85	6.50	7.75	7.95
	SD	2.91	1.91	2.94	3.36
Dysfunctional					
	M	1.37	1.25	1.41	1.48
	SD	0.39	0.24	0.53	0.48
Venting Emotions					
	M	6.15	5.85	6.90	6.60
	SD	3.33	2.28	3.85	2.78
Denial					
	M	5.10	5.40	5.60	6.60
	SD	1.33	1.39	2.82	2.43
Mental Disengagement					
	M	6.10	5.75	5.90	7.05
	SD	1.86	1.77	1.65	2.86
Behavioural Disengagement					
	M	4.35	4.25	5.05	5.30
	SD	0.99	0.72	2.76	2.49
Alcohol/Drugs					
	M	5.35	4.20	4.55	5.20
	SD	2.80	0.89	1.82	2.80

Note. Acc = accident; D.N. = death notification; S.S. = =social support

Outcome

Analyses of the three outcome items indicated no significant differences between the police officers and the control participants on ratings of performance during the court/interview situation, $F(1, 38) = 0.32$, $p > .05$, ratings of coping during the situation, $F(1, 38) = 0.19$, $p > .05$, or ratings of coping after the situation, $F(1, 38) = 0.31$, $p > .05$. Mean ratings for the two groups are presented in Table 9.

Table 9. Mean ratings and standard deviations of performance, coping during, and coping after the three work situations and the interview.

Outcome		Acc	D.N.	Court	Interview
Performance					
	M	80.00	73.05	69.85	65.60
	SD	13.89	22.35	24.86	22.98
Coping During					
	M	86.20	78.60	68.45	65.05
	SD	11.96	21.44	24.66	24.38
Coping After					
	M	87.20	86.05	75.80	80.45
	SD	15.47	15.38	28.95	23.24

Note. Acc = accident; D.N. = death notification

6.3.2 Cognitive appraisal and coping responses to work stressors

Primary Appraisal

Mean scores and standard deviations for each type of primary appraisal for each work situation are presented in Table 5. A main effect was demonstrated for primary appraisal, $F(3, 6) = 31.05$, $p < .001$. The work stressors were appraised as challenging rather than irrelevant, $F(1, 6) = 57.03$, $p < .001$, benign-positive, $F(1, 6) = 71.76$, $p < .001$, or threatening, $F(1, 6) = 10.40$, $p < .003$. The

situations also were appraised as significantly more threatening than irrelevant, $F(1, 6) = 18.72$, $p < .001$, or benign-positive, $F(1, 6) = 27.52$, $p < .001$.

Secondary Appraisal

Mean scores and standard deviations for each work situation are presented in Table 6. A main effect was demonstrated for appraisal, $F(3, 6) = 78.62$, $p < .001$. Work events were appraised as being accepted more than being amenable to change, $F(1, 6) = 107.15$, $p < .001$, or needing to know more, $F(1, 6) = 60.78$, $p < .001$, or being able to be resolved, $F(1, 6) = 17.58$, $p < .001$. The police officers felt they could resolve the work situations with the available resources more than being able to change the situation, $F(1, 6) = 37.92$, $p < .001$, or needing to know more before they could act, $F(1, 6) = 12.98$, $p < .001$. Officers appraised the situations as needing to know more rather than being able to change the situation, $F(1, 6) = 6.53$, $p < .02$.

Coping During Work Situations

Analyses of the responses recorded on the Ways of Coping (modified) demonstrated a main effect for the work situations, $F(2, 57) = 5.79$, $p < .006$. Further analyses indicated that the police officers employed significantly more coping strategies during court than during car accidents, $F(1, 57) = 7.63$, $p < .008$, or during death notifications, $F(1, 57) = 9.61$, $p < .004$.

An interaction between the stressors and individual coping strategies utilised was demonstrated, $F(12, 342) = 8.30$, $p < .001$. Mean scores and standard deviations for each coping strategy for each stressor are presented in Table 7. It was evident that the police officers used flexible problem-solving significantly more during court situations, $F(1, 57) = 17.10$, $p < .001$, and during death notifications, $F(1, 57) = 6.19$, $p < .02$, than at the scenes of car accidents. Wishful thinking was used significantly more during court than at the scenes of car accidents, $F(1, 57) =$

13.10, $p < .001$, or during death notifications, $F(1, 57) = 9.45$, $p < .004$. Anger-control followed the same pattern, with it being used more during court than the other two situations, $F(1, 57) = 24.04$, $p < .001$ (car accident), $F(1, 57) = 26.24$, $p < .001$ (death notification). Planful problem-solving also was employed more during court than at the scenes of car accidents, $F(1, 57) = 4.92$, $p < .04$. Social support was utilised significantly more at the scenes of car accidents than during the other two work situations, $F(1, 57) = 8.44$, $p < .006$ (death notification), $F(1, 57) = 17.42$, $p < .001$ (court). There were no significant differences in the use of self-control or positive reappraisal for the three work situations.

Analyses of the coping strategies utilised at the scenes of car accidents indicated that self-control was employed significantly more than flexible problem-solving, $F(1, 114) = 68.79$, $p < .001$, planful problem-solving, $F(1, 114) = 21.04$, $p < .001$, social support, $F(1, 114) = 6.70$, $p < .03$, wishful thinking, $F(1, 114) = 71.36$, $p < .001$, anger-control, $F(1, 114) = 69.48$, $p < .001$, and positive reappraisal, $F(1, 114) = 37.01$, $p < .001$. Social support was used significantly more than flexible problem-solving, $F(1, 114) = 32.56$, $p < .001$, wishful thinking, $F(1, 114) = 34.34$, $p < .001$, anger-control, $F(1, 114) = 33.04$, $p < .001$, and positive reappraisal, $F(1, 114) = 12.23$, $p < .003$. Planful problem-solving was utilised significantly more than flexible problem-solving, $F(1, 114) = 13.74$, $p < .002$, wishful thinking, $F(1, 114) = 14.90$, $p < .002$, and anger-control, $F(1, 114) = 14.05$, $p < .002$. Positive reappraisal was used more than flexible problem-solving, $F(1, 114) = 4.88$, $p < .05$, wishful thinking, $F(1, 114) = 5.59$, $p < .04$, and anger-control, $F(1, 114) = 5.07$, $p < .04$.

Analyses of the responses to coping during the delivery of death notifications indicated that self-control was used significantly more than flexible problem-solving, $F(1, 114) = 35.85$, $p < .001$, planful problem-solving, $F(1, 114) = 14.64$, $p < .001$, social support, $F(1, 114) = 42.47$, $p < .001$, wishful thinking, $F(1, 114) = 66.12$, $p < .001$, anger-control, $F(1, 114) = 78.04$, $p < .001$, and

positive reappraisal, $F(1, 114) = 29.12$, $p < .001$. Planful problem-solving was employed significantly more than flexible problem-solving, $F(1, 114) = 4.67$, $p < .04$, social support, $F(1, 114) = 7.24$, $p < .01$, wishful thinking, $F(1, 114) = 18.53$, $p < .001$, and anger-control, $F(1, 114) = 25.07$, $p < .001$. Positive reappraisal was utilised significantly more than wishful thinking, $F(1, 114) = 7.48$, $p < .009$, and anger-control, $F(1, 114) = 11.82$, $p < .001$. Flexible problem-solving also was used significantly more than wishful thinking, $F(1, 114) = 4.59$, $p < .04$, and anger-control, $F(1, 114) = 8.10$, $p < .006$. Social support was used significantly more than anger-control, $F(1, 114) = 5.37$, $p < .03$.

Analyses of the responses reported during cross-examination in court demonstrated that self-control was employed significantly more than flexible problem-solving, $F(1, 114) = 11.43$, $p < .003$, social support, $F(1, 114) = 48.29$, $p < .001$, wishful thinking, $F(1, 114) = 16.61$, $p < .001$, and positive reappraisal, $F(1, 114) = 15.44$, $p < .001$. Planful problem-solving was used significantly more than flexible problem-solving, $F(1, 114) = 7.02$, $p < .02$, social support, $F(1, 114) = 38.65$, $p < .001$, wishful thinking, $F(1, 114) = 11.18$, $p < .003$, and positive reappraisal, $F(1, 114) = 10.22$, $p < .004$. Anger-control was utilised significantly more than social support, $F(1, 114) = 30.02$, $p < .001$, wishful thinking, $F(1, 114) = 6.79$, $p < .02$, and positive reappraisal, $F(1, 114) = 6.05$, $p < .03$. Flexible problem-solving was used significantly more than social support, $F(1, 114) = 12.73$, $p < .002$, as were positive reappraisal, $F(1, 114) = 9.12$, $p < .006$, and wishful thinking, $F(1, 114) = 8.26$, $p < .008$.

Coping After Work Situations

Analysis of the responses to how police officers coped with the three work situations after they had ended demonstrated a main effect for the three groups of coping strategies, $F(2, 114) = 75.09$, $p < .001$. Further analyses indicated that police officers used significantly more emotion-focused coping strategies compared

to problem-focused coping strategies, $F(1, 114) = 55.50$, $p < .001$, and dysfunctional coping strategies, $F(1, 114) = 147.66$, $p < .001$. Furthermore, the police officers utilised significantly more problem-focused coping strategies compared to dysfunctional coping strategies, $F(1, 114) = 22.11$, $p < .001$.

Analyses on individual coping strategies demonstrated a main effect for coping strategies utilised, $F(14, 57) = 56.65$, $p < .001$. It can be seen from Table 8 that the police employed the strategy of acceptance significantly more than active coping, $F(1, 57) = 216.18$, $p < .001$, planning, $F(1, 57) = 203.24$, $p < .001$, instrumental social support, $F(1, 57) = 186.24$, $p < .001$, positive reinterpretation and growth, $F(1, 57) = 42.23$, $p < .001$, restraint coping, $F(1, 57) = 326.68$, $p < .001$, focusing on and venting emotions, $F(1, 57) = 233.23$, $p < .001$, denial, $F(1, 57) = 307.87$, $p < .001$, mental disengagement, $F(1, 57) = 262.63$, $p < .001$, behavioural disengagement, $F(1, 57) = 381.67$, $p < .001$, alcohol/drug use, $F(1, 57) = 125.67$, $p < .001$, religion, $F(1, 57) = 412.42$, $p < .001$, suppression of competing activities, $F(1, 57) = 265.27$, $p < .001$, and emotional social support, $F(1, 57) = 181.83$, $p < .001$.

The police used the strategy of positive reinterpretation and growth significantly more than active coping, $F(1, 57) = 67.31$, $p < .001$, planning, $F(1, 57) = 60.18$, $p < .001$, instrumental social support, $F(1, 57) = 51.10$, $p < .001$, restraint coping, $F(1, 57) = 134.00$, $p < .001$, focusing on and venting emotions, $F(1, 57) = 76.97$, $p < .001$, denial, $F(1, 57) = 122.05$, $p < .001$, mental disengagement, $F(1, 57) = 94.23$, $p < .001$, behavioural disengagement, $F(1, 57) = 169.99$, $p < .001$, alcohol/drug use, $F(1, 57) = 160.59$, $p < .001$, humour, $F(1, 57) = 22.20$, $p < .001$, religion, $F(1, 57) = 190.70$, $p < .001$, suppression of competing activities, $F(1, 57) = 95.82$, $p < .001$, and emotional social support, $F(1, 57) = 48.80$, $p < .001$.

Humour was utilised significantly more than active coping, $F(1, 57) = 12.20$, $p < .004$, planning, $F(1, 57) = 9.28$, $p < .01$, instrumental social support, $F(1, 57)$

= 5.94, $p < .04$, restraint coping, $F(1, 57) = 47.12$, $p < .001$, focusing on and venting emotions, $F(1, 57) = 16.50$, $p < .001$, denial, $F(1, 57) = 40.15$, $p < .001$, mental disengagement, $F(1, 57) = 24.96$, $p < .001$, behavioural disengagement, $F(1, 57) = 69.33$, $p < .001$, alcohol/drug use, $F(1, 57) = 63.37$, $p < .001$, religion, $F(1, 57) = 82.77$, $p < .001$, suppression of competing activities, $F(1, 57) = 25.78$, $p < .001$, and emotional social support, $F(1, 57) = 5.17$, $p < .05$.

Emotional social support was used significantly more than restraint coping, $F(1, 57) = 21.07$, $p < .001$, denial, $F(1, 57) = 16.50$, $p < .001$, mental disengagement, $F(1, 57) = 7.41$, $p < .02$, behavioural disengagement, $F(1, 57) = 36.63$, $p < .001$, alcohol/drug use, $F(1, 57) = 32.33$, $p < .001$, religion $F(1, 57) = 46.56$, $p < .001$, and suppression of competing activities, $F(1, 57) = 7.85$, $p < .02$.

Instrumental social support was employed significantly more than restraint coping, $F(1, 57) = 19.60$, $p < .001$, denial, $F(1, 57) = 15.20$, $p < .002$, mental disengagement, $F(1, 57) = 6.55$, $p < .03$, behavioural disengagement, $F(1, 57) = 34.69$, $p < .001$, alcohol/drug use, $F(1, 57) = 30.51$, $p < .001$, religion, $F(1, 57) = 44.37$, $p < .001$, and suppression of competing activities, $F(1, 57) = 6.97$, $p < .03$.

Planning was used significantly more than restraint coping, $F(1,57) = 14.58$, $p < .002$, denial, $F(1, 57) = 10.82$, $p < .006$, behavioural disengagement, $F(1, 57) = 27.88$, $p < .001$, alcohol/drug use, $F(1, 57) = 24.15$, $p < .001$, and religion, $F(1, 57) = 36.63$, $p < .001$.

Active coping was utilised significantly more than restraint coping, $F(1, 57) = 11.37$, $p < .005$, denial, $F(1, 57) = 8.08$, $p < .02$, behavioural disengagement, $F(1, 57) = 23.36$, $p < .001$, alcohol/drug use, $F(1, 57) = 19.96$, $p < .001$, and religion, $F(1, 57) = 31.42$, $p < .001$.

Focusing on and venting emotions was used significantly more than restraint coping, $F(1, 57) = 7.85$, $p < .02$, denial, $F(1, 57) = 5.17$, $p < .05$, behavioural

disengagement, $F(1, 57) = 18.19$, $p < .001$, alcohol/drug use, $F(1, 57) = 15.20$, $p < .002$, and religion, $F(1, 57) = 25.37$, $p < .001$.

Mental disengagement was employed significantly more than behavioural disengagement, $F(1, 57) = 11.09$, $p < .006$, alcohol/drug use, $F(1, 57) = 8.79$, $p < .02$, and religion, $F(1, 57) = 16.83$, $p < .001$. Suppression of competing activities was used significantly more than behavioural disengagement, $F(1, 57) = 10.56$, $p < .007$, alcohol/drug use, $F(1, 57) = 8.32$, $p < .02$, and religion, $F(1, 57) = 16.17$, $p < .001$. Denial, $F(1, 57) = 7.63$, $p < .02$, and restraint coping, $F(1, 57) = 25.21$, $p < .05$, were utilised significantly more than religion.

Outcome

No differences were detected between the three work situations on ratings of performance, $F(2, 57) = 1.23$, $p > .05$. A significant difference was demonstrated for the ratings of satisfaction with coping during the work situations, $F(2, 57) = 3.93$, $p < .03$. The police officers rated themselves as coping significantly better during car accidents than during court, $F(1, 57) = 7.81$, $p < .008$. No differences were detected for ratings of coping after the situations had ended, $F(2,57) = 1.80$, $p > .05$. Mean ratings are presented in Table 9.

6.3.3 Intra-individual consistency

Primary Appraisal

Correlations between the primary appraisals for each work situation, as well as mean correlations across each appraisal, can be seen in Table 10. Mean correlation coefficients ranged from $r = .07$ (challenge) to $r = .38$ (irrelevant).

Table 10. Pearson correlation coefficients between the primary appraisals of the work situations and mean correlations for each appraisal.

Primary Appraisal	A & C	A & D	C & D	Mean
Irrelevant	.28	.45*	.42	.38
Benign-Positive	.11	.27	.11	.16
Challenge	-.06	.39	-.12	.07
Threat	.06	.31	.20	.19

Note. A = accident; C = court; D = death notification

*p < .05

Secondary Appraisal

Correlations between the secondary appraisals for the three work situations and the mean correlation for each appraisal are displayed in Table 11. Mean correlation coefficients ranged from r = .05 (could change) to r = .49 (acceptance). A significant mean correlation was shown for acceptance.

Coping During Work Situations

Correlations between the coping strategies utilised during work situations are shown in Table 12, together with the mean correlation coefficients for each strategy. Mean correlation coefficients ranged from r = .04 (anger-control) to r = .54 (planful problem-solving). A significant mean correlation was demonstrated for the use of planful problem-solving.

Table 11. Pearson correlation coefficients between each secondary appraisal of the work situations and mean correlations for each appraisal.

Secondary Appraisal	A & C	A & D	C & D	Mean
Could be changed	.24	.04	-.14	.05
Had to accept	.57**	.56*	.35	.49*
Needed to know more	.04 .	29	.02	.12
Could resolve	-.23	.00	.75***	.17

Note. A = accident; C = court; D = death notification

*p < .05
**p < .01
***p < .001

Table 12. Pearson correlation coefficients between the coping strategies utilised during the three work situations and mean correlations for each coping strategy.

Coping Strategy	A & C	A & D	C & D	Mean
Problem-Focused	.33	.43	.54*	.43
Flexible P.S.	.05	.12	.39	.19
Planful P.S.	.41	.58**	.64**	.54*
Emotion-Focused	.62**	.10	.45*	.39
Social Support	.17	.25	.46*	.29
Positive Reappraisal	-.08	.35	.27	.18
Dysfunctional	.56**	.24	.38	.39
Self-Control	.21	.44*	.39	.35
Wishful Thinking	.48*	.01	.29	.26
Anger-Control	.25	-.32	.18	.04

Note. A = accident; C = court; D = death notification; P.S. = problem-solving

*p < .05
**p < .01

Coping After Work Situations

Correlations between the strategies utilised following the three work situations and mean correlations for each coping strategy are included in Table 13. Mean correlations ranged from r = .08 (alcohol and drugs; humour) to r = .96 (religion). Significant mean correlations were evident for the use of suppression of competing activities (problem-focused), emotion-focused coping strategies, including positive reinterpretation and growth, acceptance, religion and emotional social support, and the dysfunctional coping strategies of denial and mental disengagement.

6.3.4 Relationship between appraisal, coping, and satisfaction with outcome

Car Accidents

The intercorrelations between cognitive appraisal, coping strategies, and ratings of satisfaction with performance and coping can be seen in Table 14. Results demonstrated many relationships between the variables measured. The primary appraisal of threat was related to the coping strategies utilised after the police officers had left the car accident scene. Specifically, threat appraisals were positively related to the use of problem-focused strategies, including active coping, instrumental social support and restraint coping. Threat appraisals also were positively related to the use of the emotion-focused strategies of acceptance and emotional social support, as well as the dysfunctional coping strategies, including focusing on and venting emotions. Challenge appraisals were associated with increased use of planful problem-solving and self-control while at the accident scene.

When the encounter was appraised as amenable to change, the police officers reported an increase in the utilisation of dysfunctional coping strategies, including

Table 13. Pearson correlation coefficients between the coping strategies utilised following the three work situations and mean correlations for each coping strategy.

Coping Strategy	A & C	A & D	C & D	Mean
Problem-Focused	.18	.49*	.45*	.37
Active Coping	.03	.49*	.23	.25
Planning	-.16	.36	.21	.14
Instrumental S.S.	.11	.23	-.01	.11
Restraint Coping	.22	.04	.47*	.24
Suppression	.42	.42	.75***	.53 *
Emotion-Focused	.76***	.65**	.65**	.69***
Positive Reinterpretation	.49*	.42	.59**	.50 *
Acceptance	.73***	.47*	.44*	.55 *
Humour	.07	.07	.09	.08
Religion	.97***	.94***	.97***	.96***
Emotional S.S.	.49*	.59**	.47*	.52 *
Dysfunctional	.34	.19	.25	.26
Venting Emotions	.54*	.21	.05	.27
Denial	.46*	.40	.70***	.52 *
Mental Disengagement	.71***	.73***	.69***	.71***
Behavioural Disengagement	.01	.39	.21	.20
Alcohol/Drugs	.18	.14	-.07	.08

Note. A = accident; C = court; D = death notification; S.S. = social support

*p < .05
**p < .01
***p < .001

Table 14. Intercorrelations between primary appraisal, secondary appraisal, coping during and after car accidents, and police officers' satisfaction with their performance at the scene of the car accident.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
Primary Appraisal												
1. Threat	1.00	-.18	-.25	.27	.27	-.24	.17	.16	.16	-.38	-.26	-.35
2. Challenge	-	1.00	.30	-.22	-.24	-.18	.43	.28	.47 *	.19	.29	-.02
Secondary Appraisal												
3. Could change	-	-	1.00	.15	-.30	0.00	.17	-.02	.25	-.12	.10	-.33
4. Had to accept	-	-	-	1.00	.09	-.23	.17	.25	.11	-.08	-.10	-.07
5. Needed to know more	-	-	-	-	1.00	.22	.27	.35	.20	.32	.28	.24
6. Could resolve	-	-	-	-	-	1.00	-.22	-.38	-.11	-.22	.03	.35
Coping at Scene of Accident												
7. Problem-Focused	-	-	-	-	-	-	1.00	.88***	.97***	.32	.53 *	-.06
8. Flexible P.S.	-	-	-	-	-	-	-	1.00	.75***	.42	.55 *	.08
9. Planful P.S.	-	-	-	-	-	-	-	-	1.00	.25	.47 *	-.12
10. Emotion-Focused	-	-	-	-	-	-	-	-	-	1.00	.84***	.77***
11. Social Support	-	-	-	-	-	-	-	-	-	-	1.00	.29
12. Positive Reappraisal	-	-	-	-	-	-	-	-	-	-	-	1.00
13. Dysfunctional	-	-	-	-	-	-	-	-	-	-	-	-
14. Self-Control	-	-	-	-	-	-	-	-	-	-	-	-
15. Wishful Thinking	-	-	-	-	-	-	-	-	-	-	-	-
16. Anger-Control	-	-	-	-	-	-	-	-	-	-	-	-
Coping After Accident												
17. Problem-Focused	-	-	-	-	-	-	-	-	-	-	-	-
18. Active Coping	-	-	-	-	-	-	-	-	-	-	-	-
19. Planning	-	-	-	-	-	-	-	-	-	-	-	-
20. Instrumental S.S.	-	-	-	-	-	-	-	-	-	-	-	-
21. Restraint Coping	-	-	-	-	-	-	-	-	-	-	-	-
22. Suppression	-	-	-	-	-	-	-	-	-	-	-	-

Table 14 continued

Variable	1	2	3	4	5	6	7	8	9	10	11	12
23. Emotion-Focused	-	-	-	-	-	-	-	-	-	-	-	-
24. Pos. Reinterpretaton	-	-	-	-	-	-	-	-	-	-	-	-
25. Acceptance	-	-	-	-	-	-	-	-	-	-	-	-
26. Humour	-	-	-	-	-	-	-	-	-	-	-	-
27. Religion	-	-	-	-	-	-	-	-	-	-	-	-
28. Emotional S.S.	-	-	-	-	-	-	-	-	-	-	-	-
29. Dysfunctional	-	-	-	-	-	-	-	-	-	-	-	-
30. Venting Emotions	-	-	-	-	-	-	-	-	-	-	-	-
31. Denial	-	-	-	-	-	-	-	-	-	-	-	-
32. Mental Disengage.	-	-	-	-	-	-	-	-	-	-	-	-
33. Behav. Disengage.	-	-	-	-	-	-	-	-	-	-	-	-
34. Drugs/Alcohol	-	-	-	-	-	-	-	-	-	-	-	-
Outcome												
35. Performance	-	-	-	-	-	-	-	-	-	-	-	-
36. Coping During	-	-	-	-	-	-	-	-	-	-	-	-
37. Coping After	-	-	-	-	-	-	-	-	-	-	-	-

Table 14 continued

Variable	13	14	15	16	17	18	19	20	21	22	23	24
Primary Appraisal												
1. Threat	.36	.31	.40	.14	.49 *	.59**	.43	.49*	.45 *	.31	.27	.15
2. Challenge	.38	.53 *	.01	.24	.17	.01	.18	-.28	.02	.35	.25	.33
Secondary Appraisal												
3. Could change	.54 *	.36	.41	.60**	.20	.13	.24	-.36	-.03	.34	-.15	-.05
4. Had to accept	.17	.20	.17	-.01	.11	.05	.04	.11	.19	-.01	.24	-.16
5. Needed to know more	-.06	-.01	-.44	-.30	.10	-.07	-.01	.48*	.23	-.05	.38	.06
6. Could resolve	.11	-.12	-.04	.30	-.03	-.10	.24	.15	.02	-.11	-.04	-.18
Coping at Scene of Accident												
7. Problem-Focused	.47 *	.73***	.11	-.01	.59**	.37	.34	.32	.38	.45 *	.53 *	.55 *
8. Flexible P.S.	.17	.51*	.09	-.30	.39	.29	.17	.12	.25	.36	.52 *	.40
9. Planful P.S.	.56 *	.77***	.20	.13	.64**	.38	.40	.39	.41	.45 *	.50 *	.58**
10. Emotion-Focused	-.21	-.08	-.36	-.28	.15	-.05	.09	.02	.09	.24	.39	.23
11. Social Support	-.05	.06	-.23	-.09	.41	.20	.22	.13	.12	.46 *	.39	.24
12. Positive Reappraisal	-.32	-.22	-.36	-.40	-.22	-.33	-.11	-.11	.02	-.12	.22	.11
13. Dysfunctional	1.00	.83***	.79***	.72***	.68**	.62**	.68**	.14	.45 *	.50 *	.31	.37
14. Self-Control	-	1.00	.52 *	.30	.60**	.43	.50 *	.13	.50 *	.52 *	.43	.47 *
15. Wishful Thinking	-	–	1.00	.68**	.62**	.71***	.66**	.05	.47 *	.49 *	.05	.19
16. Anger-Control	-	-	-	1.00	.40	.42	.56 *	-.04	.18	.32	.06	.02
Coping After Accident												
17. Problem-Focused	-	-	-	-	1.00	.85***	.85***	.49*	.74***	.79***	.37	.54 *
18. Active Coping	-	-	-	-	-	1.00	.76***	.32	.74***	.68**	.20	.30
19. Planning	-	-	-	-	-	-	1.00	.19	.45 *	.79***	.15	.38
20. Instrumental S.S.	-	-	-	-	-	-	-	1.00	.71***	-.01	.36	.34
21. Restraint Coping	-	-	-	-	-	-	-	-	1.00	.57 *	.22	.43
22. Suppression	-	-	-	-	-	-	-	-	-	1.00	.26	.44

Table 14 continued

Variable	13	14	15	16	17	18	19	20	21	22	23	24
23. Emotion-Focused	-	-	-	-	-	-	-	-	-	-	1.00	.46 *
24. Pos. Reinterpretaton	-	-	-	-	-	-	-	-	-	-	-	1.00
25. Acceptance	-	-	-	-	-	-	-	-	-	-	-	-
26. Humour	-	-	-	-	-	-	-	-	-	-	-	-
27. Religion	-	-	-	-	-	-	-	-	-	-	-	-
28. Emotional S.S.	-	-	-	-	-	-	-	-	-	-	-	-
29. Dysfunctional	-	-	-	-	-	-	-	-	-	-	-	-
30. Venting Emotions	-	-	-	-	-	-	-	-	-	-	-	-
31. Denial	-	-	-	-	-	-	-	-	-	-	-	-
32. Mental Disengage.	-	-	-	-	-	-	-	-	-	-	-	-
33. Behav. Disengage.	-	-	-	-	-	-	-	-	-	-	-	-
34. Drugs/Alcohol	-	-	-	-	-	-	-	-	-	-	-	-
Outcome												
35. Performance	-	-	-	-	-	-	-	-	-	-	-	-
36. Coping During	-	-	-	-	-	-	-	-	-	-	-	-
37. Coping After	-	-	-	-	-	-	-	-	-	-	-	-

Table 14 continued

Variable	25	26	27	28	29	30	31	32	33	34	35	36	37
Primary Appraisal													
1. Threat	.45 *	-.19	.15	.45*	.53 *	.54 *	-.03	.21	.32	.30	.03	-.48 *	-.47 *
2. Challenge	.42	-.26	.05	.07	.08	0.00	.36	.27	.05	-.01	.47*	.18	.03
Secondary Appraisal													
3. Could change	.13	-.32	-.16	-.10	.28	.19	.02	.10	-.18	.42	-.28	-.02	-.05
4. Had to accept	.12	.23	-.07	.14	.16	.20	.15	-.06	-.05	.17	-.16	-.25	-.24
5. Needed to know more	.21	.26	.45 *	.28	-.06	.18	-.07	-.01	.05	-.35	-.03	-.26	.10
6. Could resolve	-.21	.23	.29	-.02	.13	.17	-.24	-.10	.04	.15	-.10	.19	.10
Coping at Scene of Accident													
7. Problem-Focused	.51 *	-.15	.14	.16	.30	.11	.57 *	.46 *	.50 *	.07	.25	-.21	-.29
8. Flexible P.S.	.46 *	.04	-.10	.04	.09	-.10	.51 *	.33	.42	-.04	.27	-.22	-.21
9. Planful P.S.	.48 *	-.24	.24	.21	.38	.20	-.15	.48 *	.49 *	.12	.22	-.19	-.01
10. Emotion-Focused	.16	.46 *	.13	0.00	-.03	-.10	.09	.03	-.02	.04	.61**	.37	.35
11. Social Support	.22	.16	.18	.16	.17	.06	.27	.19	.07	.16	.57**	.15	.13
12. Positive Reappraisal	.02	.61**	.03	-.19	-.25	-.24	-.16	-.17	-.12	-.12	.40	.70***	.47 *
13. Dysfunctional	.57**	.40	.16	.28	.76***	.58**	.29	.55 *	.27	.56 *	.02	-.21	-.53 *
14. Self-Control	.62**	-.40	.21	.28	.53 *	.38	.46	.53 *	.39	.26	.10	-.11	-.36
15. Wishful Thinking	.38	-.49 *	.06	.28	.81***	.61**	.04	.44	.17	.73***	-.01	-.14	-.60**
16. Anger-Control	.35	-.37	.12	.29	.63**	.57**	-.05	.24	.08	.55 *	-.08	-.13	-.47 *
Coping After Accident													
17. Problem-Focused	.55 *	-.44	.41	.48*	.88***	.74***	.16	.53 *	.39	.61**	.33	-.18	-.44
18. Active Coping	.43	-.41	.03	.30	.84***	.58**	.17	.53 *	.33	.74***	.20	-.39	-.63**
19. Planning	.43	-.45 *	.29	.32	.88***	.75***	.16	.36	.28	.20	.30	-.06	-.42
20. Instrumental S.S.	.14	0.00	.58**	.47*	.32	.41	.15	.18	.34	-.02	.01	-.35	-.20
21. Restraint Coping	.46 *	-.40	.59**	.40	.67**	.70***	-.17	.40	.45 *	.24	.24	.12	-.20
22. Suppression	-.01	-.39	.19	.31	.70***	.58**	.07	.25	.13	.66**	.49*	.17	-.14

Table 14 continued

Variable	25	26	27	28	29	30	31	32	33	34	35	36	37
23. Emotion-Focused	.70***	.36	.33	.59**	.20	.27	.54 *	.10	.12	.02	.43	.01	-.13
24. Pos. Reinterpretaton	.43	-.08	.23	.10	.21	.16	.26	.11	.31	.09	.30	.20	.16
25. Acceptance	1.00	-.19	.28	.62**	.51 *	.51 *	.16	.36	.28	.20	.28	-.29	-.55 *
26. Humour	-	-1.00	-.26	-.24	-.48 *	-.46 *	.22	-.37	-.18	-.22	.14	.25	.41
27. Religion	-	-	1.00	.72***	.35	.67**	-.15	.13	-.01	-.10	.22	.12	.01
28. Emotional S.S.	-	-	-	1.00	.50 *	.79***	0.00	.08	-.04	.20	.24	-.17	.30
29. Dysfunctional	-	-	- -	-	1.00	.85***	-.04	.56 *	.27	.78***	.23	-.24	-.60**
30. Venting Emotions	-	-	-	-	-	1.00	-.25	.24	.02	.55 *	.15	-.16	-.40
31. Denial	-	-	-	-	-	-	1.00	.31	.21	-.08	.18	-.04	-.19
32. Mental Disengage.	-	-	-	-	-	-	-	1.00	.41	.16	.20	-.29	-.55 *
33. Behav. Disengage.	-	-	-	-	-	-	-	-	1.00	-.05	-.06	-.10	-.28
34. Drugs/Alcohol	-	-	-	-	-	-	-	-	-	1.00	.22	-.11	-.41
Outcome													
35. Performance	-	-	-	-	-	-	-	-	-	-	1.00	.36	.05
36. Coping During	-	-	-	-	-	-	-	-	-	-	-	1.00	.69**
37. Coping After	-	-	-	-	-	-	-	-	-	-	-	-	1.00

Note: P.S. = problem-solving; S.S. = social support
*p<.05
**p<.01
***p<.001

anger-control, at the scene of the accident. The secondary appraisal of needing to know more was associated with the use of instrumental social support and religion after the police officers had left the scene of the car accident.

The different groups of coping strategies were related when the police officers reported the strategies employed while at the car accident scene. The use of problem-focused coping strategies at the scene was positively related to the use of social support (emotion-focused), as well as dysfunctional coping strategies, including self-control.

The ways in which police officers coped at the scene of car accidents was related to how they coped after they had left the accident scene. Problem-focused coping strategies employed at the scene of the accident were associated with increased use of problem-focused, emotion-focused and dysfunctional strategies after the police officer had left the scene. Utilising dysfunctional coping strategies at the accident scene was positively correlated with using problem-focused, emotion-focused and dysfunctional strategies after the police officer had left the scene.

The different categories of coping strategies were seen to be related when police officers reported how they coped after leaving the scene of car accidents. The use of problem-focused coping strategies was positively related to the use of the emotion-focused coping strategies of positive reinterpretation and growth, acceptance and emotional social support, as well as dysfunctional coping strategies, including focusing on and venting emotions, mental disengagement and the use of alcohol and drugs. The utilisation of emotion-focused coping strategies was related to the use of denial.

Police officers' ratings of performance at the scene of the car accident were related to primary appraisal of the encounter and the coping strategies utilised during the encounter. Ratings of performance were positively correlated with challenge appraisals. They also were positively associated with the use of emotion-

focused coping strategies, including social support, while at the accident scene. Furthermore, higher ratings were associated with the use of suppression of competing activities after leaving the accident scene.

Ratings of satisfaction with coping at the scene were negatively correlated with threat appraisals. These ratings were positively correlated with the use of positive reappraisal while at the accident scene and with ratings of satisfaction with coping after leaving the accident scene.

Ratings of how well the police officers thought they coped after leaving the accident scene were negatively related to threat appraisals and to the use of active coping (problem-focused), acceptance (emotion-focused), and dysfunctional coping strategies, including mental disengagement, following the situation.

To summarise the results for car accidents, threat appraisals were related to how police officers coped after leaving the scene of the accident, and to lower levels of satisfaction with coping both at the scene and after leaving the scene of the car accident. Challenge appraisals were related to the coping strategies employed at the scene of the car accident, and with higher ratings of performance during the encounter. Appraising the car accident as amenable to change was related to the use of dysfunctional coping strategies at the scene. Higher ratings of performance were associated with the use of emotion-focused coping strategies at the accident scene. Police officers' ratings of satisfaction with coping at the scene were positively related to ratings of coping after leaving the scene of the car accident.

Death Notifications

The intercorrelations between cognitive appraisal, coping, and ratings of satisfaction with performance and coping are displayed in Table 15. A number of relationships between the variables were demonstrated. Threat appraisals were positively related to the use of flexible problem-solving, as well as dysfunctional coping strategies, including wishful thinking and anger-control, during the

Table 15. Intercorrelations between primary appraisal, secondary appraisal, coping during and after death notifications, and police officers' satisfaction with their performance during death notifications.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
Primary Appraisal												
1. Threat	1.00	-.19	.38	.31	.42	-.35	.40	.59**	.19	-.04	-.11	.06
2. Challenge	-	1.00	-.25	.21	-.01	.53*	.42	.23	.48*	.24	.42	-.10
Secondary Appraisal												
3. Could change	-	-	1.00	-.08	.49*	-.27	.07	-.11	.19	.24	-.04	.43
4. Had to accept	-	-	-	1.00	-.02	.35	.32	.03	.19	.30	.07	.40
5. Needed to know more	-	-	-	-	1.00	-.25	.52 *	.42	.51*	.19	.12	.16
6. Could resolve	-	-	-	-	-	1.00	.15	.01	.23	.24	.40	-.07
Coping During Death Notification												
7. Problem-Focused	-	-	-	-	-	-	1.00	.86***	.92***	.41	.39	.20
8. Flexible P.S.	-	-	-	-	-	-	-	1.00	.60**	.19	.16	.13
9. Planful P.S.	-	-	-	-	-	-	-	-	1.00	.49*	.49*	.22
10. Emotion-Focused	-	-	-	-	-	-	-	-	-	1.00	.78***	.70***
11. Social Support	-	-	-	-	-	-	-	-	-	-	1.00	.11
12. Positive Reappraisal	-	-	-	-	-	-	-	-	-	-	-	1.00
13. Dysfunctional	-	-	-	-	-	-	-	-	-	-	-	-
14. Self-Control	-	-	-	-	-	-	-	-	-	-	-	-
15. Wishful Thinking	-	-	-	-	-	-	-	-	-	-	-	-
16. Anger-Control	-	-	-	-	-	-	-	-	-	-	-	-
Coping After Death Notification												
17. Problem-Focused	-	-	-	-	-	-	-	-	-	-	-	-
18. Active Coping	-	-	-	-	-	-	-	-	-	-	-	-
19. Planning	-	-	-	-	-	-	-	-	-	-	-	-
20. Instrumental S.S.	-	-	-	-	-	-	-	-	-	-	-	-
21. Restraint Coping	-	-	-	-	-	-	-	-	-	-	-	-
22. Suppression	-	-	-	-	-	-	-	-	-	-	-	-

Table 15 continued

Variable	1	2	3	4	5	6	7	8	9	10	11	12
23. Emotion-Focused	-	-	-	-	-	-	-	-	-	-	-	-
24. Pos. Reinterpretaton	-	-	-	-	-	-	-	-	-	-	-	-
25. Acceptance	-	-	-	-	-	-	-	-	-	-	-	-
26. Humour	-	-	-	-	-	-	-	-	-	-	-	-
27. Religion	-	-	-	-	-	-	-	-	-	-	-	-
28. Emotional S.S.	-	-	-	-	-	-	-	-	-	-	-	-
29. Dysfunctional	-	-	-	-	-	-	-	-	-	-	-	-
30. Venting Emotions	-	-	-	-	-	-	-	-	-	-	-	-
31. Denial	-	-	-	-	-	-	-	-	-	-	-	-
32. Mental Disengage.	-	-	-	-	-	-	-	-	-	-	-	-
33. Behav. Disengage.	-	-	-	-	-	-	-	-	-	-	-	-
34. Drugs/Alcohol	-	-	-	-	-	-	-	-	-	-	-	-
Outcome												
35. Performance	-	-	-	-	-	-	-	-	-	-	-	-
36. Coping During	-	-	-	-	-	-	-	-	-	-	-	-
37. Coping After	-	-	-	-	-	-	-	-	-	-	-	-

Table 15 continued

Variable	13	14	15	16	17	18	19	20	21	22	23	24
Primary Appraisal												
1. Threat	.68**	.40	.63**	.63**	.29	-.04	.21	0.00	.27	.46 *	.49 *	.46 *
2. Challenge	.07	.06	-.17	.19	.19	.20	.06	-.07	-.13	-.05	-.15	.02
Secondary Appraisal												
3. Could change	.42	.36	.42	.22	.30	.20	.21	-.07	.70***	.24	.05	.23
4. Had to accept	.53 *	.49*	.42	.29	.03	-.12	-.10	-.08	.17	.11	.60**	.17
5. Needed to know more	.27	.16	.36	.17	.30	.19	.05	.32	.17	.06	-.08	-.03
6. Could resolve	-.15	-.02	-.06	-.28	-.07	-.16	.13	.21	-.13	-.35	.15	-.11
Coping During Death Notification												
7. Problem-Focused	.52 *	.38	.46 *	.38	.31	0.00	.35	.27	.12	.30	.33	.44
8. Flexible P.S.	.61**	.45*	.55 *	.44	.11	-.17	.12	.11	-.07	.20	.50 *	.50 *
9. Planful P.S.	.35	.27	.31	.26	.40	.12	.47 *	.35	.25	.32	.14	.32
10. Emotion-Focused	.25	.21	.32	.10	.33	.15	.41	.57**	.27	.12	.45 *	.27
11. Social Support	.09	-.04	.16	.14	.49 *	.26	.51 *	.78***	.22	.20	.29	.09
12. Positive Reappraisal	.30	.37	.32	-.01	-.04	-.05	.07	.02	.19	-.03	.37	.33
13. Dysfunctional	1.00	.87***	.64**	.72***	.37	.14	.33	-.01	.48 *	.57**	.74***	.63**
14. Self-Control	-	1.00	.44	.37	.13	.02	.14	-.18	.42	.34	.62**	.62**
15. Wishful Thinking	-	–	1.00	.23	-.02	-.31	.08	-.08	.23	.13	.47 *	.43
16. Anger-Control	-	-	-	1.00	.68***	.50*	.51 *	.26	.38	.78***	.58**	.35
Coping After Death Notification												
17. Problem-Focused	-	-	-	-	1.00	.79***	.82***	.61**	.64**	.78***	.35	.16
18. Active Coping	-	-	-	-	-	1.00	.57**	.50*	.37	.54 *	.09	-.15
19. Planning	-	-	-	-	-	-	1.00	.45*	.57**	.81***	.33	.34
20. Instrumental S.S.	-	-	-	-	-	-	-	1.00	.04	.24	.19	-.16
21. Restraint Coping	-	-	-	-	-	-	-	-	1.00	.64**	.26	.43
22. Suppression	-	-	-	-	-	-	-	-	-	1.00	.41	.36

Table 15 continued

Variable	13	14	15	16	17	18	19	20	21	22	23	24
23. Emotion-Focused	-	-	-	-	-	-	-	-	-	-	1.00	.57**
24. Pos. Reinterpretaton	-	-	-	-	-	-	-	-	-	-	-	1.00
25. Acceptance	-	-	-	-	-	-	-	-	-	-	-	-
26. Humour	-	-	-	-	-	-	-	-	-	-	-	-
27. Religion	-	-	-	-	-	-	-	-	-	-	-	-
28. Emotional S.S.	-	-	-	-	-	-	-	-	-	-	-	-
29. Dysfunctional	-	-	-	-	-	-	-	-	-	-	-	-
30. Venting Emotions	-	-	-	-	-	-	-	-	-	-	-	-
31. Denial	-	-	-	-	-	-	-	-	-	-	-	-
32. Mental Disengage.	-	-	-	-	-	-	-	-	-	-	-	-
33. Behav. Disengage.	-	-	-	-	-	-	-	-	-	-	-	-
34. Drugs/Alcohol	-	-	-	-	-	-	-	-	-	-	-	-
Outcome												
35. Performance	-	-	-	-	-	-	-	-	-	-	-	-
36. Coping During	-	-	-	-	-	-	-	-	-	-	-	-
37. Coping After	-	-	-	-	-	-	-	-	-	-	-	-

Table 15 continued

Variable	25	26	27	28	29	30	31	32	33	34	35	36	37
Primary Appraisal													
1. Threat	.53 *	-.29	.37	.58**	.72***	.63**	-.13	.43	.28	.37	-.50*	-.61**	-.45 *
2. Challenge	.07	.13	-.01	.07	.08	.01	.24	.07	.02	.17	.07	.12	.19
Secondary Appraisal													
3. Could change	.17	-.24	-.09	.07	.46 *	.52 *	-.19	.25	-.06	.16	-.37	-.60**	-.63**
4. Had to accept	.55 *	.34	.10	.15	.12	.21	.20	-.02	.10	-.09	-.35	-.25	-.26
5. Needed to Know more	.20	-.44	-.19	.38	.49 *	.56**	-.01	.16	-.12	.40	-.04	-.29	-.23
6. Could resolve	.24	.19	.10	.02	-.33	-.01	.10	-.35	-.41	-.31	-.04	.24	.22
Coping During Death Notification													
7. Problem-Focused	.41	-.19	.15	.22	-.43	.27	.07	.41	.21	.15	-.15	-.28	-.38
8. Flexible P.S.	.57**	-.16	.23	.40	.41	.29	-.02	.30	.28	.16	-.13	-.20	-.05
9. Planful P.S.	.21	-.18	.06	.04	.36	.20	.13	.41	.11	.12	-.14	-.28	-.09
10. Emotion-Focused	.39	.38	-.09	.07	.26	.08	.16	.35	-.03	.20	-.02	-.08	-.14
11. Social Support	.25	.20	.05	.16	.29	.12	-.15	.33	-.05	.30	.06	.09	.05
12. Positive Reappraisal	.33	.37	-.20	-.08	.08	0.00	.04	.18	.01	-.01	-.10	-.23	-.28
13. Dysfunctional	.73***	-.01	.20	.28	.63**	.42	.12	.57 *	.44	.14	-.39	-.45 *	-.53 *
14. Self-Control	.65**	-.11	.02	.15	.28	.14	-.11	.40	.20	-.12	-.22	-.28	-.40
15. Wishful Thinking	.57**	-.02	.29	.18	.38	.44	0.00	.25	-.02	.01	-.50*	-.51 *	-.38
16. Anger-Control	.45 *	.15	.24	.33	.82***	.48 *	0.00	.61**	.76***	.46 *	-.28	-.33	-.42
Coping After Death Notification													
17. Problem-Focused	.30	-.06	.15	.30	.78***	.52 *	.31	.61**	.39	.37	-.13	-.19	-.38
18. Active Coping	0.00	.11	-.02	.08	.48 *	.25	.23	.34	.35	.47 *	.17	.06	-.22
19. Planning	.20	0.00	.29	.08	.48 *	.20	.19	.79***	.45 *	.19	-.18	-.26	-.30
20. Instrumental S.S.	.15	.15	.09	.49*	.45 *	.32	.01	.29	-.04	.55 *	0.00	0.00	-.11
21. Restraint Coping	.27	-.27	-.01	.05	.54 *	.40	.23	.58**	.14	-.01	-.30	-.42	-.59**
22. Suppression	.24	-.03	.26	.16	.73***	.26	.26	.84***	.65**	.26	-.32	-.41	-.50 *

Table 15 continued

Variable	25	26	27	28	29	30	31	32	33	34	35	36	37
23. Emotion-Focused	.91***	.30	.25	.39	.49 *	.32	.18	.50 *	.34	.01	-.21	-.10	-.28
24. Pos. Reinterpretation	.53 *	-.23	.18	.11	.40	.18	-.05	.60**	.24	-.13	-.22	-.28	-.22
25. Acceptance	1.00	.06	.15	.50*	.48 *	.47 *	.18	.39	.15	-.06	-.15	-.07	-.26
26. Humour	-	-1.00	-.09	-.32	-.13	-.28	-.10	-.09	.15	.05	.02	.22	.10
27. Religion	-	-	1.00	.31	.18	.33	-.24	.03	-.08	-.05	-.59**	-.50 *	-.45 *
28. Emotional S.S.	-	-	-	1.00	.51 *	.60**	-.18	.16	-.13	.43	-.19	-.27	-.36
29. Dysfunctional	-	-	- -	-	1.00	.74***	.02	.75***	.46 *	.49 *	-.37	-.48 *	-.51 *
30. Venting Emotions	-	-	-	-	-	1.00	-.11	.22	-.07	.22	-.53*	-.52 *	-.58**
31. Denial	-	-	-	-	-	-	1.00	.28	.05	-.24	.26	.36	.27
32. Mental Disengage.	-	-	-	-	-	-	-	1.00	.55 *	.17	-.19	-.28	-.31
33. Behav. Disengage.	-	-	-	-	-	-	-	-	1.00	.25	.06	.02	0.00
34. Drugs/Alcohol	-	-	-	-	-	-	-	-	-	1.00	.13	-.15	-.08
Outcome													
35. Performance	-	-	-	-	-	-	-	-	-	-	1.00	.87***	.71***
36. Coping During	-	-	-	-	-	-	-	-	-	-	-	1.00	.80***
37. Coping After	-	-	-	-	-	-	-	-	-	-	-	-	1.00

Note: P.S. = problem-solving; S.S. = social support
*p<.05
**p<.01
***p<.001

situation. Threat appraisals also were positively related to the use of emotion-focused coping strategies as well as dysfunctional coping strategies after the encounter. Challenge appraisals were positively related to the secondary appraisal of being able to resolve the situation, and there was a trend for this primary appraisal to be positively associated with using problem-focused coping strategies during the death notification ($p = .067$).

The secondary appraisal of acceptance was positively correlated with using dysfunctional coping strategies during the death notification, and with employing emotion-focused coping strategies after the death notification. The appraisal of needing to know more was associated with using problem-focused coping strategies during the death notification.

The different groups of coping strategies were related when the police officers reported the coping strategies employed while delivering the death notification. The use of problem-focused coping strategies was positively correlated with the use of wishful thinking (dysfunctional). The use of flexible problem-solving was positively associated with the use of dysfunctional coping strategies, including self-control and wishful thinking.

The ways in which the police officers coped during the death notification was related to how they coped after delivering the death notification. Employing flexible problem-solving during the situation was positively related to using emotion-focused coping strategies, including positive reinterpretation and growth and acceptance, after the situation. The use of emotion-focused coping strategies during the encounter was positively related to using instrumental social support (problem-focused), as well as emotion-focused coping strategies after the encounter. The utilisation of dysfunctional coping strategies during the death notification was positively correlated with employing the problem-focused strategies of restraint coping and suppression of competing activities, emotion-focused coping strategies, including positive reinterpretation and growth and

acceptance, as well as dysfunctional coping strategies, including mental disengagement, after the death notification.

The different categories of coping strategies were seen to be related when police officers reported how they coped after leaving the home where the death notification had been delivered. Employing problem-focused coping strategies was positively related to using dysfunctional coping strategies, including focusing on and venting emotions and mental disengagement. The use of emotion-focused coping strategies also was positively related to utilising dysfunctional coping strategies, including mental disengagement.

Police officers' ratings of performance during the death notification were negatively correlated with threat appraisals. Ratings also were negatively correlated with the use of wishful thinking during the encounter, and religion (emotion-focused) and focusing on and venting emotions (dysfunctional) after the encounter. Ratings of performance were positively correlated with ratings of satisfaction with coping both during and after the death notification.

Police officers' ratings of satisfaction with coping during the death notification were negatively related to threat appraisals and the secondary appraisal of amenable to change. Ratings also were negatively correlated with utilising dysfunctional coping strategies, including wishful thinking, during the death notification, and with the use of religion (emotion-focused) and dysfunctional coping strategies, including focusing on and venting emotions, after the death notification. Ratings of satisfaction with coping during the encounter were positively associated with ratings of coping after the encounter.

Ratings of satisfaction with coping after the death notification were negatively related to threat appraisals and the secondary appraisal of amenable to change. Ratings also were negatively associated with the use of dysfunctional coping strategies during the death notification, and with the use of restraint coping,

suppression of competing activities (both problem-focused), religion (emotion-focused) and dysfunctional coping strategies after the death notification.

To summarise the results for death notifications, threat appraisals were positively associated with employing dysfunctional coping strategies during the encounter and emotion-focused coping strategies after the encounter. Threat appraisals were negatively associated with ratings of performance during the death notification, and with ratings of satisfaction with coping both during and after the death notification. The secondary appraisal of amenable to change was negatively associated with ratings of coping during and after the work situation. The appraisal of acceptance was related to the use of dysfunctional coping during the death notification and emotion-focused coping strategies after the death notification. Needing to know more was related to the use of dysfunctional coping after delivering the message. Police officers' ratings of performance were negatively related to the use of wishful thinking and religion as coping strategies. Ratings of satisfaction with coping during the death notification were negatively related to employing positive reappraisal and wishful thinking during the situation, and dysfunctional coping strategies and religion after the situation. Police officers' ratings of satisfaction with coping after the death notification were negatively associated with the use of restraint coping, suppression of competing activities, religion and dysfunctional coping strategies after the encounter. Ratings of performance were positively associated with ratings of satisfaction with coping during and after the death notification.

Court

The intercorrelations between cognitive appraisal, coping strategies utilised and ratings of satisfaction with performance and coping are included in Table 16. Threat appraisals of court situations were positively associated with the secondary appraisal of acceptance ($p = .051$), and with the use of problem-focused coping

Table 16. Intercorrelations between primary appraisal, secondary appraisal, coping during and after court, and police officers' satisfaction with their performance during court.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
Primary Appraisal												
1. Threat	1.00	-.57**	.16	.44	.28	.10	-.09	-.10	-.07	.01	.09	-.13
2. Challenge	-	1.00	.05	-.16	.11	.12	.33	.38	.25	-.17	-.21	.11
Secondary Appraisal												
3. Could change	-	-	1.00	-.30	.46 *	.30	.10	.06	.12	-.20	-.29	.03
4. Had to accept	-	-	-	1.00	.03	.10	-.11	-.10	-.09	-.23	-.08	-.14
5. Needed to know more	-	-	-	-	1.00	.18	.12	.07	.15	-.44	-.20	-.10
6. Could resolve	-	-	-	-	-	1.00	.03	-.07	.11	.06	0.00	0.00
Coping During Court												
7. Problem-Focused	-	-	-	-	-	-	1.00	.91***	.94***	.34	.52 *	.76***
8. Flexible P.S.	-	-	-	-	-	-	-	1.00	.71***	.22	.44	.72***
9. Planful P.S.	-	-	-	-	-	-	-	-	1.00	.39	.52 *	.69**
10. Emotion-Focused	-	-	-	-	-	-	-	-	-	1.00	.55 *	.57**
11. Social Support	-	-	-	-	-	-	-	-	-	-	1.00	.63**
12. Positive Reappraisal	-	-	-	-	-	-	-	-	-	-	-	1.00
13. Dysfunctional	-	-	-	-	-	-	-	-	-	-	-	-
14. Self-Control	-	-	-	-	-	-	-	-	-	-	-	-
15. Wishful Thinking	-	-	-	-	-	-	-	-	-	-	-	-
16. Anger-Control	-	-	-	-	-	-	-	-	-	-	-	-
Coping After Court												
17. Problem-Focused	-	-	-	-	-	-	-	-	-	-	-	-
18. Active Coping	-	-	-	-	-	-	-	-	-	-	-	-
19. Planning	-	-	-	-	-	-	-	-	-	-	-	-
20. Instrumental S.S.	-	-	-	-	-	-	-	-	-	-	-	-
21. Restraint Coping	-	-	-	-	-	-	-	-	-	-	-	-
22. Suppression	-	-	-	-	-	-	-	-	-	-	-	-

Table 16 continued

Variable	1	2	3	4	5	6	7	8	9	10	11	12
23. Emotion-Focused	-	-	-	-	-	-	-	-	-	-	-	-
24. Pos. Reinterpretaton	-	-	-	-	-	-	-	-	-	-	-	-
25. Acceptance	-	-	-	-	-	-	-	-	-	-	-	-
26. Humour	-	-	-	-	-	-	-	-	-	-	-	-
27. Religion	-	-	-	-	-	-	-	-	-	-	-	-
28. Emotional S.S.	-	-	-	-	-	-	-	-	-	-	-	-
29. Dysfunctional	-	-	-	-	-	-	-	-	-	-	-	-
30. Venting Emotions	-	-	-	-	-	-	-	-	-	-	-	-
31. Denial	-	-	-	-	-	-	-	-	-	-	-	-
32. Mental Disengage.	-	-	-	-	-	-	-	-	-	-	-	-
33. Behav. Disengage.	-	-	-	-	-	-	-	-	-	-	-	-
34. Drugs/Alcohol	-	-	-	-	-	-	-	-	-	-	-	-
Outcome												
35. Performance	-	-	-	-	-	-	-	-	-	-	-	-
36. Coping During	-	-	-	-	-	-	-	-	-	-	-	-
37. Coping After	-	-	-	-	-	-	-	-	-	-	-	-

Table 16 continued

Variable	13	14	15	16	17	18	19	20	21	22	23	24
Primary Appraisal												
1. Threat	.28	.02	.23	.33	.47 *	.27	.42	.28	.28	29	.25	.20
2. Challenge	-.12	.25	-.15	-.29	-.20	-.17	-.22	.28	-.32	-.35	.09	.12
Secondary Appraisal												
3. Could change	-.04	-.04	-.07	.02	-.14	.02	.04	.02	-.11	-.40	-.07	-.13
4. Had to accept	-.10	-.02	.04	-.20	.02	-.36	-.22	.38	.09	.12	.06	-.13
5. Needed to know more	-.24	-.22	-.07	-.21	.15	.20	.24	.21	0.00	-.15	-.06	.01
6. Could resolve	-.02	.29	-.35	.05	.23	.24	.41	.18	.04	-.13	.34	.35
Coping During Court												
7. Problem-Focused	.41	.38	.39	.21	.45 *	.21	.26	.34	.36	.33	.56 *	.29
8. Flexible P.S.	.26	.29	.15	.16	.33	.11	.07	.50*	.18	.20	.51 *	.24
9. Planful P.S.	.48 *	.40	.52 *	.22	.49 *	.26	.38	.17	.46 *	.38	.53 *	.31
10. Emotion-Focused	.55 *	.36	.40	.47 *	.42	.22	.37	-.27	.56 *	.64**	.53 *	.34
11. Social Support	.24	-.04	.41	.18	.69**	.32	.50 *	.16	.65**	.69**	.33	.18
12. Positive Reappraisal	.20	.19	.26	.05	.42	.14	.19	.14	.50 *	.47 *	.51 *	.29
13. Dysfunctional	1.00	.72***	.61**	.86***	.41	.37	.43	-.24	.39	.48 *	.63**	.54 *
14. Self-Control	-	1.00	.12	.52 *	.14	.27	.19	-.15	.09	.05	.70***	.72***
15. Wishful Thinking	-	–	1.00	.29	.37	.12	.27	-.15	.44	.64**	.16	.05
16. Anger-Control	-	-	-	1.00	.39	.42	.47 *	-.22	.32	.36	.57**	.46 *
Coping After Court												
17. Problem-Focused	-	-	-	-	1.00	.73***	.86***	.29	.71***	.76***	.49 *	.49 *
18. Active Coping	-	-	-	-	-	1.00	.81***	-.08	.38	.36	.39	.68**
19. Planning	-	-	-	-	-	-	1.00	.07	.48 *	.51 *	.48 *	.60**
20. Instrumental S.S.	-	-	-	-	-	-	-	1.00	-.15	-.06	.19	-.05
21. Restraint Coping	-	-	-	-	-	-	-	-	1.00	.79***	.25	.19
22. Suppression	-	-	-	-	-	-	-	-	-	1.00	.31	.21

Table 16 continued

Variable	13	14	15	16	17	18	19	20	21	22	23	24
23. Emotion-Focused	-	-	-	-	-	-	-	-	-	-	1.00	.81***
24. Pos. Reinterpretaton	-	-	-	-	-	-	-	-	-	-	-	1.00
25. Acceptance	-	-	-	-	-	-	-	-	-	-	-	-
26. Humour	-	-	-	-	-	-	-	-	-	-	-	-
27. Religion	-	-	-	-	-	-	-	-	-	-	-	-
28. Emotional S.S.	-	-	-	-	-	-	-	-	-	-	-	-
29. Dysfunctional	-	-	-	-	-	-	-	-	-	-	-	-
30. Venting Emotions	-	-	-	-	-	-	-	-	-	-	-	-
31. Denial	-	-	-	-	-	-	-	-	-	-	-	-
32. Mental Disengage.	-	-	-	-	-	-	-	-	-	-	-	-
33. Behav. Disengage.	-	-	-	-	-	-	-	-	-	-	-	-
34. Drugs/Alcohol	-	-	-	-	-	-	-	-	-	-	-	-
Outcome												
35. Performance	-	-	-	-	-	-	-	-	-	-	-	-
36. Coping During	-	-	-	-	-	-	-	-	-	-	-	-
37. Coping After	-	-	-	-	-	-	-	-	-	-	-	-

Table 16 continued

Variable	25	26	27	28	29	30	31	32	33	34	35	36	37
Primary Appraisal													
1. Threat	.27	.71***	.03	.30	.39	.35	.18	.12	.39	.32	-.40	-.42	-.32
2. Challenge	-.05	.15	.08	.27	-.29	-.08	-.19	-.38	-.41	-.30	.38	.35	.29
Secondary Appraisal													
3. Could change	.10	.06	-.23	-.04	-.19	-.17	-.24	-.05	-.15	-.18	-.17	.13	.37
4. Had to accept	-.10	.06	0.00	.40	.10	.14	.10	-.22	.14	-.22	.10	-.22	-.23
5. Needed to know more	.05	.03	-.26	.04	-.17	-.15	-.29	-.17	-.12	-.20	.02	.28	.33
6. Could resolve	.39	.33	-.18	-.16	.14	.03	.18	.02	.20	.18	-.32	-.13	.12
Coping During Court													
7. Problem-Focused	.49 *	.40	-.14	.23	.33	.09	.38	.37	.46 *	.30	0.00	.08	.06
8. Flexible P.S.	.38	.36	.08	.44	.22	.10	.19	.23	.32	.13	.18	.08	.06
9. Planful P.S.	.52 *	.38	-.31	.03	.36	.07	.49 *	.42	.50 *	.39	-.14	.07	.05
10. Emotion-Focused	.52 *	.13	.21	0.00	.66**	.44	.63**	.75***	.58**	.63**	-.48*	-.55 *	-.52 *
11. Social Support	.29	.07	-.07	-.14	.68**	.30	.67**	.64**	.83***	.66**	-.35	-.36	-.39
12. Positive Reappraisal	.48 *	.33	.02	.15	.34	.03	.38	.54 *	.53 *	.29	-.16	-.08	-.04
13. Dysfunctional	.55 *	.22	.19	.15	.58**	.54 *	.51 *	.48 *	.43	.46 *	-.20	-.37	-.39
14. Self-Control	.63**	.51 *	.05	.11	.13	.17	.20	.06	.08	.06	.07	-.01	-.39
15. Wishful Thinking	.07	-.14	.01	.07	.47 *	.28	.57**	.45 *	.47 *	.51 *	-.15	-.24	-.33
16. Anger-Control	.55 *	.17	.32	.15	.61**	.64**	.37	.52 *	.39	.42	-.30	-.50 *	-.51 *
Coping After Court													
17. Problem-Focused	.47 *	0.00	-.10	.01	.71***	.38	.65**	.59**	.79***	.69**	-.49*	-.30	-.33
18. Active Coping	.49 *	0.00	-.14	-.22	.26	.03	.28	.34	.35	.25	-.38	.08	-.01
19. Planning	.58**	.09	-.15	-.23	.57**	.29	.47 *	.48 *	.61**	.56 *	-.62**	-.01	-.23
20. Instrumental S.S.	.03	.12	.03	.56*	.07	.04	-.03	-.19	.14	.06	.12	-.27	0.00
21. Restraint Coping	.27	-.15	-.19	-.18	.76***	.46 *	.77***	.70***	.78***	.73***	-.49*	.07	-.41
22. Suppression	.19	-.11	.08	.02	.78***	.45 *	.77***	.75***	.81***	.77***	-.37	-.40	-.58**

Table 16 continued

Variable	25	26	27	28	29	30	31	32	33	34	35	36	37
23. Emotion-Focused	.92***	.64**	.32	.37	.42	.36	.27	.41	.38	.21	-.15	-.22	-.46 *
24. Pos. Reinterpretaton	.80***	.42	.21	.07	.22	.18	.16	.18	.22	.07	-.16	-.10	.01
25. Acceptance	1.00	.64**	.11	.12	.34	.23	.17	.42	.34	.17	-.33	-.10	-.23
26. Humour	-	-1.00	-.03	.02	-.11	-.18	-.24	.13	0.00	-.26	.26	.16	.24
27. Religion	-	-	1.00	.60**	.20	.50 *	-.06	.16	-.11	-.09	.22	-.40	-.48 *
28. Emotional S.S.	-	-	-	1.00	.15	.38	-.06	-.09	-.09	-.05	.18	-.28	-.34
29. Dysfunctional	-	-	- -	-	1.00	.83***	.83***	.72***	.86***	.90***	-.54*	-.79***	-.73***
30. Venting Emotions	-	-	-	-	-	1.00	.52 *	.41	.46 *	.62**	-.35	-.78***	-.86***
31. Denial	-	-	-	-	-	-	1.00	.62**	.84***	.92***	-.49*	-.48 *	-.53 *
32. Mental Disengage.	-	-	-	-	-	-	-	1.00	.67**	.60**	-.35	-.38	-.48 *
33. Behav. Disengage.	-	-	-	-	-	-	-	-	1.00	.88***	-.55*	-.53 *	-.50 *
34. Drugs/Alcohol	-	-	-	-	-	-	-	-	-	1.00	-.66**	-.67**	-.63**
Outcome													
35. Performance	-	-	-	-	-	-	-	-	-	-	1.00	.61**	.46 *
36. Coping During	-	-	-	-	-	-	-	-	-	-	-	1.00	.86***
37. Coping After	-	-	-	-	-	-	-	-	-	-	-	-	1.00

Note: P.S. = problem-solving; S.S. = social support
*p<.05
**p<.01
***p<.001

strategies and humour (emotion-focused) after the court situation. Threat appraisals were negatively associated with challenge appraisals.

When court situations were appraised as being amenable to change, the police officers reported they needed to know more before they could act. Needing to know more was associated with the use of emotion-focused coping strategies during court ($p = .054$).

The different groups of coping strategies were related when the police officers reported the strategies utilised while in court. Utilisation of problem-focused coping strategies was positively related to the use of social support and positive reappraisal (both emotion-focused). The use of emotion-focused strategies was positively related to the use of dysfunctional coping strategies, including anger-control.

The ways in which the police officers coped during court was related to the ways in which they coped after leaving the court room. The use of problem-focused coping strategies during the encounter was positively related to using problem-focused, as well as emotion-focused coping strategies after the encounter. The utilisation of emotion-focused coping strategies in court was positively correlated with using emotion-focused and dysfunctional coping strategies after the encounter. Employing dysfunctional coping strategies during this work situation was associated with using emotion-focused and dysfunctional coping strategies after the situation had ended.

The different categories of coping strategies were seen to be related when police officers reported how they coped after the court situation. Using problem-focused coping strategies was positively correlated with employing emotion-focused coping strategies, including positive reinterpretation and growth and humour, as well as all the dysfunctional coping strategies.

Police officers' ratings of performance were negatively related to the use of emotion-focused coping strategies during the court situation. Ratings also were

negatively associated with employing problem-focused coping strategies, including planning and restraint coping, emotion-focused strategies, including religion, as well as dysfunctional strategies, including denial, behavioural disengagement and use of drugs and alcohol, after the court situation. Ratings of performance were positively correlated with ratings of satisfaction with coping both during and after the situation.

Ratings of satisfaction with coping during court were negatively associated with the use of emotion-focused coping strategies and anger-control (dysfunctional) during court. Ratings also were negatively associated with the utilisation of dysfunctional coping strategies, including focusing on and venting emotions, denial, behavioural disengagement and use of drugs and alcohol, following the encounter. There was a positive correlation between ratings of satisfaction with coping both during and after the court experience.

Ratings of how well the police officers thought they coped after leaving the court room were negatively related to employing emotion-focused coping strategies and anger-control (dysfunctional) after the court situation. Ratings also were negatively correlated with the use of suppression of competing activities, emotion-focused coping strategies, including religion, and all of the dysfunctional coping strategies.

To summarise the results for court, threat and challenge appraisals were negatively correlated. Threat appraisals were positively correlated with the use of problem-focused coping strategies after leaving court. Changeable appraisals were related to needing to know more. Police officers' ratings of performance during the encounter were negatively correlated with employing emotion-focused coping at the same time and problem-focused and dysfunctional coping after the court situation. Ratings of performance were positively associated with ratings of coping both during and after court. Ratings of satisfaction with coping during court were negatively related to the use of emotion-focused coping and anger-control during

court, as well as with the use of dysfunctional coping strategies after court. Ratings of satisfaction with coping following the court appearance were negatively associated with the utilisation of emotion-focused coping and anger-control during court, and with employing emotion-focused coping and dysfunctional coping after the court situation. Ratings of satisfaction with coping during and after court were positively correlated.

DISCUSSION

The transactional model of stress proposed that the processes of cognitive appraisal and coping mediate the effects of stressful encounters on individuals (Lazarus, 1966; Lazarus & Folkman, 1984). Occupational stress researchers, however, have paid little attention to the process of cognitive appraisal in their research. This has been noted as a weakness in research conducted to date (Dewe, 1992). Based on a Swedish study investigating appraisal processes of police officers (Larsson et al., 1988), it was predicted that police officers would appraise work situations as challenging rather than threatening. Analyses demonstrated a main effect for primary appraisal, indicating that the police officers did indeed appraise their work situations as challenging. They also appraised them as threatening, but less so than challenging. The Swedish study also demonstrated the predominance of challenge appraisals, followed by threat appraisals, of work situations (Larsson et al., 1988).

The police officers reported the secondary appraisal of acceptance more often than any of the other secondary appraisals tested, which was similar to that previously demonstrated (Kirmeyer & Diamond, 1985; Larsson et al., 1988). Swedish officers appraised their work situations as having to be accepted but also as resolvable (Larsson et al., 1988). The police officers in this study indicated that the work situations were resolvable, but to a lesser extent than the Swedish police

officers. In the other study (Kirmeyer & Diamond, 1985), 55% of the American police officers appraised their work situations as having to be accepted. Therefore, research investigating secondary appraisal processes of police officers have demonstrated similar results. The nature of the situations being appraised may explain the slight differences between the Swedish study and the present study.

Consistent with previous research (Evans et al., 1993; Larsson et al., 1988), it was predicted that police officers would employ more problem-focused coping strategies than emotion-focused coping strategies when dealing with the work situations. Results did not differentiate between the groups of strategies measured, and this prediction was not supported. This result was in contrast with studies of other police officers who responded to questionnaires measuring general coping behaviours (Evans et al, 1993; Larsson et al., 1988). A recent survey of Australian police officers (Evans et al., 1993) demonstrated the prevalence of problem-focused coping strategies when dealing with work stress. However, the authors noted a concern that the police officers were not dealing with their emotions, because of the few emotion-focused coping strategies reportedly utilised by the police officers. Therefore, the lack of a difference between the use of problem- and emotion-focused coping strategies in this sample of police officers may have indicated more effective coping, from the perspective of regulating both the problem and the distress caused by the problem (Carver et al., 1989; Folkman & Lazarus, 1980, 1985; Pearlin & Schooler, 1978). However, it must be noted that there also was no discrimination between use of these two types of coping strategies, and use of dysfunctional coping strategies.

The utilisation of some of the coping strategies were context specific. For example, strategies such as planful problem-solving, wishful thinking and anger-control were employed significantly more during court. Social support was used significantly more at the scenes of car accidents than during court or delivering death notifications. Therefore, the police officers differentially employed some

coping strategies to varying degrees, according to the situation with which they were dealing.

Due to the paucity of research investigating the coping processes of police officers outside work, the prediction that officers would employ more problem-focused strategies after the work situations had ended was based on the way they were predicted to cope during the encounters. Results indicated that the police officers used significantly more emotion-focused coping strategies than problem-focused coping strategies after the work situations had ended. An interaction between the work situations and individual coping strategies was not demonstrated. Instead, strategies such as acceptance, positive reinterpretation and growth, humour and emotional social support were the most used strategies for the three work situations, all of which are emotion-focused. The correlations between the three work stressors, for each coping strategy, indicated consistent usage of the strategies following each encounter, with the exception of humour. Therefore, it appeared that police officers did not use different coping strategies to deal with different work situations after the situations had ended. Instead, they relied primarily on emotion-focused strategies to deal with the feelings aroused by the work situations.

This reliance on emotion-focused coping strategies was of interest, especially in light of the secondary appraisal that predominated, namely acceptance of the situations. It may be that the police officers simply accepted what occurred, they dealt with it as best they could, and then dealt with the emotions that may have been generated by the type of work in which they engaged. Indeed, this relationship was demonstrated for death notifications, but not for the other two work situations. The reliance on emotion-focused coping strategies following work events also demonstrated the need for programmes to assist police officers to deal with the stress of their work. Employee Assistance Programmes (Moriarity & Field, 1990)

and CISD procedures (Mitchell & Bray, 1989; Smith & de Chesnay, 1994) have begun to serve such a role for police officers.

It has been demonstrated that the police officers employed different coping strategies for different work events when those events were in progress, but they relied on the same emotion-focused strategies when the events had ended. In order to understand police coping behaviours more fully, discrimination of work situations was needed, at least when measuring coping during work encounters. Thus, research to date (e.g. Alexander & Walker, 1994; Evans et al., 1993; Fain & McCormick, 1988) which has examined how police generally coped has not provided the complete picture on the coping processes of police officers.

The differences in coping during and after the work situations provided support for the contention that coping was a process (Folkman & Lazarus, 1985; Lazarus & Folkman, 1984). The fact that the police officers' coping behaviours changed from one point in time to another indicated that the operational tasks were not static unitary events, but rather were dynamic unfolding processes (Folkman & Lazarus, 1985). It appeared, therefore, inappropriate to refer to these work situations globally. The work situations consisted of stages, and the police officers responded to the stages differently. It would appear important to further investigate the components of these work situations, and the ways in which the police officers responded to them.

The transactional model of stress has emphasised the relationship between primary appraisal, secondary appraisal, coping and the outcome of an encounter. This aspect of the research was rather exploratory, given the paucity of research conducted on the transactional nature of occupational stress (Dewe, 1991b, 1992). Different relationships between the variables were demonstrated for the three work situations. For example, a significant negative correlation was demonstrated between challenge and threat appraisals for court situations, but not for the other two situations. For death notifications, challenge appraisals were associated with

resolvable appraisals, but this was not the case for attendance at car accidents or court appearances. Results clearly indicated that how a police officer coped during an encounter also was related to how they coped after an encounter. The precise relationships, however, differed according to the encounter being examined. Thus, the relationship between variables was dependent, at least in part, on the situation being experienced.

The importance of primary appraisal was highlighted in this study. Threat appraisals were associated with other variables present in an encounter. For car accidents, threat appraisals were positively correlated with the coping strategies employed after the encounter, including the utilisation of problem-focused coping strategies such as active coping, instrumental social support and restraint coping. Further, threat appraisals were associated with employing the emotion-focused coping strategies of acceptance and emotional social support, as well as dysfunctional coping strategies, including focusing on and venting emotions. Threat appraisals also were associated with a number of coping strategies employed during and after death notifications. Thus, the results supported the transactional model of stress which proposed that threat appraisals called for coping efforts (Lazarus & Folkman, 1984). Whereas challenge appraisals also were regarded as calling for coping efforts, few relationships between this appraisal and coping strategies were demonstrated.

Differences between threat and challenge appraisals were demonstrated for the outcome items. Threat appraisals were negatively associated with ratings of performance during death notifications, which was similar to that demonstrated by Larsson et al. (1988). In contrast, challenge appraisals were positively associated with ratings of performance during car accidents. Threat appraisals also were associated with lower ratings of satisfaction with coping during and after all three situations.

The results of this study, therefore, suggested that threat appraisals were associated with the coping strategies a police officer utilised during and after a work situation, with perceptions of poorer performance during an encounter and with lower satisfaction with coping during and after a work situation. Challenge appraisals were related to few variables, but a noticeable relationship existed between this appraisal and higher ratings of performance during car accidents. The results of the study clearly indicated the importance of primary appraisal in the unfolding of an encounter. The importance of primary appraisal also was demonstrated by Dewe (1991b), who indicated a relationship between appraisal and the dependent variables of tension and constraint.

The secondary appraisal, amenable to change, was negatively associated with police officers' ratings of satisfaction with coping both during and after delivering a death message. The most highly rated secondary appraisal for the police officers was that of acceptance, and this appraisal was positively associated with the use of dysfunctional coping strategies during death notifications, as well as the use of emotion-focused coping strategies after the message had been delivered. The various secondary appraisals were related to far fewer variables compared to the primary appraisals tested.

Correlations between coping strategies utilised during and after an encounter were demonstrated for each work stressor, to varying degrees. For example, using problem-focused coping strategies during a court appearance was associated with using emotion-focused and dysfunctional coping strategies after leaving court. The same relationships were demonstrated for attendance at car accidents, but not for death notifications. For death notifications, using problem-focused strategies during the encounter was related to using dysfunctional coping strategies at the same time. The relationship between using dysfunctional coping strategies during and after a stressful work situation was a robust finding for all three situations. Therefore, using poor coping strategies during a stressful work situation was

positively correlated with using poor strategies after the situation had ended. This was not always the case when using problem- or emotion-focused strategies.

The strong correlation between satisfaction with coping during and after each situation was demonstrated for each work situation. Strong correlations between satisfaction with coping on both occasions and satisfaction with performance were demonstrated for death notifications and court appearances, but not for attendance at car accidents. While it may not be possible to be definitive, the relatively helpless role police officers play at the scenes of serious car accidents (Hermann, 1989) may have resulted in the lack of a relationship between performance and satisfaction with coping both during and after attendance at such accidents.

It was evident, then, that different relationships existed between the many variables present in a stressful encounter. Clearly, there was merit in examining situations separately, if the nature of appraisal and coping associated with each situation was to be understood. Examining work stress from a more general perspective would appear to hide the complexities in the ways in which people dealt with stressful encounters. The work situations examined were different, and the police officers dealt with them differently during their occurrence. Furthermore, different relationships existed between the variables that were present during the unfolding of each experience.

As indicated, the intercorrelations demonstrated many effects between the variables present in an encounter. Due to the exploratory nature of the research, it was necessary to include all of the variables in the analysis. It was acknowledged that the number of correlations calculated may have resulted in an increase in Type 1 error. It is to be noted, however, that the correlations with an alpha of .05, whether viewed as significant or as trends, highlighted a number of potential relationships present in an encounter. Future research can now focus on specific, narrower aspects of the transactional model of stress in an occupational setting. For example, threat appraisals of car accidents were related to the subsequent

employment of a variety of coping strategies by the police officers once they had left the scene of the accident. This relationship, between appraisal and coping after an encounter, could be investigated in future research. Such research should utilise a larger sample, which would enable more powerful statistical analyses, such as regression and the related procedures of path analysis, to be employed (Tabachnick & Fidell, 1989). It is to be noted that the sample size in the current research resulted, at least in part, as a consequence of the requirement of the police officers to have had experienced all three work situations.

The degree of intra-individual consistency varied according to the variable under examination. Little consistency was seen for primary appraisal, although a relationship appeared to exist for irrelevant appraisals. A significant correlation was evident for consistency for the secondary appraisal of acceptance. As previously noted, this appraisal was rated most highly by the police officers, and it was reported consistently in relation to all three work situations. During the work situations one coping strategy was employed consistently, that of planful problem-solving. Police officers showed more consistency with the strategies used after an incident had ended. Significant mean correlation coefficients were demonstrated for the problem-focused coping strategy of suppression of competing activities, the emotion-focused strategies of positive reinterpretation, denial, religion, and emotional social support, and the dysfunctional coping strategy of mental disengagement.

Overall, there was little consistency shown across all three work situations, with the exception being for coping strategies employed following each situation. This was in contrast to previous research documenting the ways in which police officers generally coped with work situations (Larsson et al., 1988; Wearing & Hart, 1996). Previous research has indicated that both stable personality factors and the context of coping shaped the coping strategies employed when dealing with a stressful situation (Folkman, Lazarus, Gruen & DeLongis, 1986). The results of

the current study indicated that the context of the encounter was important for the selection of coping strategies. Significantly more consistency was shown in the coping strategies utilised following the work situations, indicating the relevance of stable individual factors such as personality.

The comparison of the police officers to the control group on cognitive appraisal and coping with a stressful situation demonstrated few differences. It was noted that appearance in court was appraised as more threatening than attendance at an interview, and that the police utilised more self-control and anger-control than the control group. The control group used more social support than the police officers. There were no differences in the groups' perceptions of performance during the encounter, nor on their ratings of how well they coped during and after the encounter. The differences demonstrated may have reflected differences in the situations themselves, rather than the police officers reacting in a peculiar way. In court, police officers have reported the need to defend their reputation, both professionally and personally (Kroes, 1976; McLaren, 1990). As a consequence, police officers have reported strong feelings of anger when in the court room. This was different to most interviews that the control participants had experienced. Thus, it has been contended that differences between the two encounters were responsible for the differences detected between the two groups. These differences have highlighted the difficulties in including comparison groups in research. Whereas it must be considered imperative to have equal situations being monitored, this has proven impossible. For example, consideration was given to including a comparison group of individuals who had appeared as witnesses in court. However, such individuals would have differed from the police officers, as police officers have been trained to appear as witnesses in court. Further, the role they play in court was different to that of civilians. In reality, it has, therefore, been contended that there was no perfect comparison group, nor

exact situation with which to compare the police officers and their experience of court.

The differences on the Coping Resources Inventory were of interest. The police officers reported significantly fewer cognitive resources on which to draw in a stressful encounter, and they also possessed fewer emotional resources and total number of resources. There was no reason to suspect the control participants had an unusually high number of resources available to them. Increasing the resources available to cope with stressful encounters may be one area of boosting the police officers' abilities to handle the stressful situations they experienced at work. The area of coping resources may prove a fruitful area for future research within the realm of police stress.

In summary, it has been demonstrated that the ways in which police officers coped during work situations was dependent, at least in part, on the situation itself. Therefore, there was support for the contention that in order to understand how individuals coped, it was necessary to understand the nature of the situation with which they are coping (Lazarus & Folkman, 1984). It also has been demonstrated that primary appraisal was an important variable in the occupational stress process. Research not measuring cognitive appraisal appeared to be missing a valuable aspect of the process.

The results of this study have indicated the ways in which police officers responded cognitively and behaviourally to stressful work situations. They interpreted the operational tasks as challenging and as having to be accepted. The police officers employed a variety of coping strategies during the work situations. Following the situations, they relied on emotion-focused coping strategies, especially acceptance, positive reinterpretation and growth, humour and emotional social support. Further, the differences detected in coping during and after the work situations confirmed that coping was a process, and that the operational tasks consisted of stages.

The literature reviewed previously, however, indicated that individuals also responded psychophysiologically to stress (Fleming & Baum, 1987; Steptoe, 1991). It was necessary, therefore, to investigate how police officers responded psychophysiologically to the three operational tasks. Further, an inspection of the stress literature indicated that little had been documented regarding the psychophysiological correlates of cognitive appraisal and specific coping strategies. Consequently, the third study extended the current research by examining the psychophysiological correlates of the work stressors, cognitive appraisal and coping strategies utilised.

CHAPTER SEVEN

STRESSORS, COGNITIVE APPRAISAL, COPING AND PSYCHOPHYSIOLOGY

7. STRESSORS, COGNITIVE APPRAISAL, COPING AND PSYCHOPHYSIOLOGY

7.1 The psychophysiological measurement of stress

Study Two investigated the ways in which police officers responded cognitively and behaviourally to the three operational tasks. Results indicated that they perceived the tasks to be challenging and as having to be accepted. A variety of coping strategies were employed to deal with the situations and the emotions aroused by the encounters. The police officers reported utilising emotion-focused coping strategies after the work situations had ended. Results from this study also indicated that operational tasks consisted of at least two stages, as the coping strategies employed differed during the actual incidents and after the incidents.

It has previously been argued that stress is a whole body response (Fleming & Baum, 1987; Steptoe, 1991). Accordingly, a methodology involving the measurement of psychophysiological and subjective aspects of stress is required in order to comprehensively investigate the process of stress (Balick & Herd, 1987; Burke, 1987c; Fleming & Baum, 1987; Ganster et al., 1982). Researchers in the general stress area (Bruning & Frew, 1987; Burke, 1987c; Folkman, Lazarus, Dunkel-Schetter, et al., 1986; Fried et al., 1984), as well as those investigating police stress (Larsson et al., 1988), have acknowledged the limits of the exclusive use of self-report data in stress research.

Consequently, it was necessary to further investigate the ways in which the police officers responded to the operational tasks. It was necessary to establish the psychophysiological, as well as the subjective, responses to the work situations. Additionally, the psychophysiological correlates of the cognitive and behavioural responses, namely appraisal and coping, also needed to be investigated.

As previously noted, the most commonly employed psychophysiological indices of occupational stress have been BP (Bohlin et al., 1986; Frankenhaeuser et al., 1989; Goldstein et al., 1992; Hutt & Weidner, 1993; Lundberg et al., 1989; Pincomb et al., 1987; Sausen et al., 1992; Siegrist & Klein, 1990) and HR (Douglas et al., 1988; Frankenhaeuser et al., 1989; Goldstein et al., 1992; Kuorinka & Korhonen, 1981; Lundberg et al., 1989; Payne & Rick, 1986; Pincomb et al., 1987; Sausen et al., 1992; Siegrist & Klein, 1990; Smith, 1988). Research also has utilised other indices of psychophysiological arousal, such as EMG (Gomer et al., 1987) and oral temperature (Pokorny et al., 1988). Whereas some of this research, including Study One, has compared work days to nonwork days in order to assess the impact of work on psychophysiological arousal (e.g., Frankenhaeuser et al., 1989; Goldstein et al., 1992; Lundberg et al., 1989; Steptoe et al., 1996), other research has investigated the impact of specific elements of work on arousal (e.g., Gomer et al., 1987; Kuorinka & Korhonen, 1981; Payne & Rick, 1986).

7.2 Stressors and psychophysiology

Researchers establishing the impact of specific elements of work on psychophysiological arousal have employed different approaches in their investigations. For example, whereas some research (Gomer et al., 1987) has identified specific work practices to be investigated, others have used ambulatory recordings together with monitoring activities to demonstrate the effects of stressors on arousal (e.g., Goldstein et al., 1992; Payne & Rick, 1986).

Research which investigated two work practices governing machine paced keyboard operation in a mail sorting room utilised EMG as a dependent variable (Gomer et al., 1987). Results demonstrated differences between workers using the two work practices in terms of a shift in surface EMG due to muscle fatigue. On

the basis of these results, it was possible to recommend the work practice which impacted less on the muscle tension experienced by the workers. The authors concluded multiple categories of dependent variables were needed, including additional psychophysiological variables, in order to fully understand the impact of work practises on employees. On the basis of such results, changes to work practises could then be proposed and supported.

A study on reactions of firefighters to fire alarms employed ambulatory recordings of HR as an indicator of arousal (Kuorinka & Korhonen, 1981). Results indicated a mean increase of 61 BPM from the onset of the alarm to the peak measure during responding to the alarm. The authors concluded, on the basis of no further increases in HR as the firefighters approached the scene of the fire, that this rapid increase in HR was due to abrupt physical activity, as opposed to arousal resulting from a stress response. However, this finding did not exclude the possibility of a conditioned stress reaction to the alarm based on prior training and experience.

Research using ambulatory recordings of HR and BP have demonstrated the effects of specific situations on these psychophysiological responses (Goldstein et al., 1992; Payne & Rick, 1986). Payne and Rick (1986) employed HR as an indicator of stress in surgeons and anaesthetists. The methodology involved the use of a miniature body-borne tape recorder (Medilog 1), with the ECG signal being detected by two chest electrodes, as well as the recording of work activities. It was found that changes in HR were sensitive to reactions to psychological stressors. For example, analysis of one participant's HR trace indicated substantial increases (20-30 beats per minute) in HR when the surgeon was conducting difficult procedures on children. Analyses of all surgeons in this study demonstrated elevated HR when the surgeons were operating compared to engaging in other activities, such as speaking with the relatives of patients.

A study of work stress in paramedics using ambulatory recordings of BP demonstrated elevated BP when paramedics were in certain locations and performing specific tasks (Goldstein et al., 1992). For example, when paramedics were riding in an ambulance, SBP was 9.8 mmHg higher than when they were riding in a car on their day off work. Similarly, when the paramedics were in the hospital environment, SBP was 7.2 mmHg higher than when they were at places such as a shopping centre or restaurant on their nonwork day. Thus, in this study, elevated BP was associated with specific work situations.

Whereas the cardiovascular measures utilised in the research employing ambulatory recordings were a positive step in the study of stressors, the methodology had its limitations. For example, in the study of surgeons and anaesthetists (Payne & Rick, 1986), stressful experiences, as reported by the participants, were not always associated with increased HR. Additionally, HR increased without any apparent connection with environmental stressors or changes in physical activity. In the study of firefighters (Kuorinka & Korhonen, 1981), the significant elevations in HR were concluded to result from abrupt physical activity, rather than a stress response. Despite these limitations HR has been reported to change frequently in response to stressors, and also the resolution of those stressors. "Used in this way HR has a limited but useful role as a marker of stress at work" (Payne & Rick, 1986, p. 418).

It appeared that occupational stress researchers using ambulatory recordings of psychophysiological responses to stress were researching general stress associated with a specific occupation A paucity of research has investigated the impact of specific work events or situations on the psychological and psychophysiological responses of workers. In the general stress literature, however, public speaking was one specific stressor that had been investigated (Bolm-Audorff et al., 1989; Houtman & Bakker, 1991a, 1991b). Research has shown that, for a group of 10 postgraduate students, catecholamine and lipid levels

were significantly elevated on the day of giving a speech in public compared to a control day (Bolm-Audorff et al., 1989). Analysis of HR reactivity and cortisol secretion during public speaking demonstrated that arousal was high not only during the stressor, but also in anticipation of the stressor (Houtman & Bakker, 1991a). Other research also indicated that public speaking was a stressful experience, with anxiety and psychophysiological arousal (HR and cortisol) increasing in response to this stressor even after 3 months of practice with the stressor (Houtman & Bakker, 1991b).

Thus, researchers have employed different methods of investigating the psychophysiological concomitants of stress associated with specific conditions. Some have used ambulatory recordings of HR and BP, some have taken samples of salivary cortisol, and others have compared whole day measurements on which the stressor has occurred to days during which the stressor was not experienced. To a considerable extent, researchers have not examined psychophysiological arousal in relation to specific work situations.

7.3 Cognitive appraisal and psychophysiology

As previously detailed, cognitive appraisal has been used to refer to the process through which a person evaluated whether an encounter was relevant to their well being, and if so, in what ways (Folkman, Lazarus, Dunkel-Schetter et al., 1986). Two components of the appraisal process were proposed, primary appraisal and secondary appraisal. Primary appraisal referred to the person evaluating whether they had anything at stake in the encounter. In secondary appraisal, the individual evaluated whether anything could be done to overcome or prevent harm, or to improve the prospects for benefit. During secondary appraisal, coping options were evaluated (Lazarus & Folkman, 1984).

Within the transactional model of stress, Lazarus and Folkman (1984) proposed that the psychophysiological stress response to encounters appraised as challenging would be different from those appraised as threatening. Lazarus (1991) provided a thorough review of research demonstrating that cognitive appraisal affected psychophysiological responses as well as psychological responses to stressors. Early research (Lazarus & Alfert, 1964; Speisman, Lazarus, Mordkoff & Davison, 1964) used film stimuli and accompanying sound tracks to manipulate cognitive appraisals of the films. Results demonstrated that primary appraisals of threat were associated with increased skin conductance responses. Other research (Holmes & Houston, 1974) in which participants were encouraged to redefine or appraise the experience of electric shocks as interesting new physiological sensations has demonstrated that participants reported less anxiety and showed less psychophysiological arousal during shocks compared to participants who did not redefine the experience. Thus, research has demonstrated that primary appraisal affected psychophysiological arousal to encounters. The literature reviewed, however, has only examined the effects of threat appraisals on psychophysiological arousal. Thus, the psychophysiological correlates of challenge appraisals have received scant attention.

More recent research has attempted to addressed this shortcoming (Tomaka et al., 1993). In their series of three experiments, Tomaka et al. monitored skin conductance responses and a number of cardiovascular measures, including HR, as well as self-reports of primary appraisal, secondary appraisal, and stress, while college students participated in a passive coping task (watching a videotape presentation of graphic material) or an active coping task (mental arithmetic). The results of importance were those concerning the active coping task, since the participants were required to actively engage in the task. Results consistently demonstrated that individuals who appraised the active task as a challenge evidenced significantly greater psychophysiological arousal than individuals who

appraised the task as threatening. Differences between appraisals were more consistent and powerful for cardiovascular measures compared to skin conductance responses. Self-reported stress was higher when the task was appraised as threatening, rather than challenging. Thus, research has indicated that, in response to laboratory stressors, challenge appraisals were associated with increased psychophysiological arousal, consistent with energy mobilisation and active coping efforts (Averill, 1973), whereas threat appraisals were associated with higher self-reports of stress.

Though not directly assessing cognitive appraisal, research by Gomez and McLaren (in press) demonstrated that performance on a computer task involving rewards for participants was associated with increased positive mood and elevated HR. Performance on another version of the same task, involving punishment, was related to increased negative mood and SCL. There are clear parallels between the reward condition and challenge appraisals and the punishment condition and threat appraisals, as evidenced by Lazarus and Folkman's (1984) description of these appraisals. Thus, this research indirectly supported the link between challenge and threat appraisals and differential patterns of psychophysiological responding.

Other research has investigated psychophysiological responses to cognitive appraisals (Frankenhaeuser, 1982; Smith, 1989), though they were not defined in the terms employed by Lazarus and Folkman (1984). Frankenhaeuser (1982) has provided a summary of research conducted in the laboratory by herself and her colleagues. The methods employed in such research have ranged from physical workload induced by bicycle riding, verbal rote-learning tasks and mental arithmetic. Results from the laboratory indicated that the appraisals of distress and effort were differentially related to catecholamine and cortisol secretion. Appraisals of effort were related to catecholamine secretion, whereas appraisals of distress were related primarily to cortisol secretion.

Smith (1989) investigated the psychophysiological arousal patterns of HR, EMG and skin conductance level (SCL), to imaged scenarios depicting the appraisals of pleasantness, effort (high or low) and human agency (self-agency: subject is largely controlling the situation; other-agency: some other person is largely controlling the situation). Eyebrow EMG demonstrated increased muscular activity for effort-related appraisals. There was a tendency for forehead EMG to follow this same pattern of increased arousal to effort-related appraisals. HR reactivity provided strong support for the relationship between the appraisal of anticipated effort and psychophysiological arousal. Imaged scenarios depicting high effort were accompanied by elevated HR. SCL was associated with the same appraisal, though not as strongly as HR. SCL was generally higher under conditions of high-effort. There were differences, however, between the dependent variables when closer analyses of the data were performed. To summarise the results of Smith's work, increased eyebrow EMG was associated with perceived obstacles, increased HR was associated with anticipated effort, and increased SCL was associated with attentional activity. Smith concluded that further investigations of the relationship between cognitive appraisals and psychophysiological arousal were necessary to provide convergent validity for self-report based findings, and to validate the interpretation of the appraisal dimensions.

It was evident that little research had been conducted on the relationship between cognitive appraisal and psychophysiological arousal. Previous research has investigated different types of appraisals, specifically threat, challenge, distress, pleasantness, effort and human agency. Within the transactional model of stress, it has been shown that challenge appraisals were associated with increased HR and threat appraisals were associated with increased SCL and self-reported stress. There appeared to be no studies that had investigated the psychophysiological correlates of cognitive appraisals of work situations. This may be viewed as a distinct limitation in the occupational stress literature.

7.4 Coping and psychophysiology

Researchers have employed psychophysiological measures of arousal when investigating coping in a number of studies (e.g., Blair, Wing & Wald, 1991; Bongard, Hodapp, Frisch & Lennartz, 1994; Gerin, Pieper, Marchese & Pickering, 1992; Hasenfratz & Battig, 1991, 1992, 1993; Hodapp, Bongard & Heiligtag, 1992; Houtman & Bakker, 1991a, 1991b; Sherwood, Dolan & Light, 1990; Sosnowski, Nurzynska & Polec, 1991; Steptoe & Vögele, 1992; Vitaliano, Russo & Niaura, 1995). Some of this research has documented psychophysiological arousal in response to active and passive stressors in the laboratory. Passive stressors, such as electric shocks and watching film stimuli, have been labelled as such because participants were given no opportunity to control or to perform in the situation and, consequently, were passive recipients of external stimulation (Tomaka et al., 1993). Tasks such as mental arithmetic and Stroop tasks were labelled as active because the participants were required to actively perform in such tasks (Tomaka et al., 1993).

Research employing active and passive tasks consistently demonstrated that cardiovascular responses were stronger to active coping compared to passive coping (Bongard et al., 1994; Gerin et al., 1992; Hasenfratz & Battig, 1991, 1992, 1993; Hodapp et al., 1992; Sherwood et al., 1990; Sosnowski et al., 1991). Koolhaas (1994), in his review of literature concerning acute coping and arousal, concluded that individuals who employed active coping were vulnerable to hypertension and heart disease due to the associated high sympathetic activity. One study included a dimension of control in the design, as well as active and passive tasks (Gerin et al., 1992). Results indicated that cardiovascular responses were significantly greater in the passive coping task, indicating that when effort was held constant, enhanced control during a laboratory task diminished reactivity. However, the majority of the research has shown that cardiovascular reactivity was

greater to active coping than passive coping. Similar results have been demonstrated for skin conductance levels (Sosnowski et al., 1991).

Little research on coping and psychophysiological arousal has been conducted on natural stressors. Furthermore, less research has investigated the impact of specific coping strategies on psychophysiological arousal. Recently, Houtman and Bakker (1991a) tested the coping effectiveness of student teachers when confronted by the specific stressor of lecturing. Results demonstrated that cortisol secretion was negatively associated with the use of active problem-solving and social support, and was positively associated with palliative responding and depressive responding. HR responses were positively associated with seeking social support, depressive responding and palliative responding. Thus, different relationships may exist between variables, depending on the psychophysiological response being measured.

One study has documented the psychophysiological correlates of specific coping strategies in an occupational setting (Wright & Sweeney, 1989). In this research, coping in 95 civil service employees was investigated using the Ways of Coping Checklist. DBP was measured during work hours and prior to completing the coping questionnaire. Results demonstrated that elevated DBP was associated with a greater reliance on the coping strategies of wishful thinking, avoidance and minimisation of threat. Thus, there was some evidence to suggest that elevated DBP was associated with the use of specific coping strategies.

The impact of social support on psychophysiological responses to stress has been investigated by a number of researchers (Gerin, Milner, Chawla & Pickering, 1995; Kamarck, Manuck & Jennings, 1990; Kirschbaum, Klauer, Filipp & Hellhammer, 1995; Lepore, 1995; Levy et al., 1990; Thomas, Goodwin & Goodwin, 1985). Research has investigated the relationship between perceived social support and immune function in 61 women with Stage 1 or Stage 2 breast cancer who had just been released from hospital (Levy et al., 1990). Results

indicated that the perception of high quality social support from a partner and from their physician was related to more healthy immune function. Further, employing the coping strategy of actively seeking social support was beneficial for the women. Direct effects of social support on cardiovascular measures were demonstrated when participants played a video game in the presence of a partner or alone (Gerin et al., 1995). Results evidenced lower DBP and self-reported stress in the partnered condition.

Other research has established the buffering, or indirect, effects of social support on psychophysiology. For example, Kamarck et al. (1990) demonstrated that BP and HR responses were smaller in female students who performed demanding mental tasks in the presence of a friend compared to participants who performed the tasks alone. Similar results have been demonstrated for the stressor of public speaking (Kirschbaum et al., 1995; Lepore, 1995). One study (Houtman & Bakker, 1991a) has shown HR to be positively correlated with seeking social support. Seeking social support may be different to actually using social support.

There is some research that has investigated the impact of specific coping strategies on psychophysiological arousal. However, this research appeared to have constituted a small part of the coping literature. Therefore, very little is known of the psychophysiological correlates of specific coping strategies. Only one study has utilised an occupational group.

7.5 Summary

It has been contended that the stress response is a whole body response, involving psychological and psychophysiological changes. Research investigating the effects of specific situations on individuals has evidenced methodological limitations, with ambulatory recordings of HR being inconsistently related to stressors. One of the most influential models of stress, the transactional model, has

rarely been investigated using psychophysiological dependent variables. Indeed, Folkman, Lazarus, Dunkel-Schetter, et al. (1986), as well as other researchers (e.g., Larsson et al., 1988), have acknowledged the limits of the sole use of self-report data when investigating stress using this model.

Research using laboratory based tasks have indicated that threat appraisals were associated with increased SCL and self-reported levels of stress, whereas challenge appraisals were associated with increased cardiovascular responses. Research has not documented the relationship between appraisals of work situations and psychophysiological responses to those situations. Research also has not demonstrated the relationship between secondary appraisals and psychophysiological arousal. Research has been conducted into the relationship between coping and psychophysiological arousal, though the main focus of this research has been on laboratory stressors and coping. Again, the area of occupational coping has received scant attention. Additionally, little is known about the relationship between specific coping strategies and psychophysiological arousal. It was evident that research was required which investigated the psychological and psychophysiological impact of specific work situations on individuals. Furthermore, research was needed within a work context which documented the psychophysiological and psychological correlates of cognitive appraisal, secondary appraisal and coping.

CHAPTER EIGHT

THE PSYCHOPHYSIOLOGICAL CORRELATES OF STRESSORS, COGNITIVE APPRAISAL AND COPING

8. THE PSYCHOPHYSIOLOGICAL CORRELATES OF STRESSORS, COGNITIVE APPRAISAL AND COPING

8.1 Introduction

The results from Study One provided evidence for the existence of occupational stress in Tasmanian police officers. The cardiovascular and self-reported measures were all higher on work days compared to nonwork days. However, police officers were neither more psychophysiologically aroused nor more stressed than the comparison group of clerical workers. It appeared that being a police officer was no more stressful than being a clerical worker. There was evidence that the stress in both occupations was linked to specific occupational tasks.

It was previously highlighted that there were many potential sources of stress for police officers (e.g., Brown & Campbell, 1990; Duckworth, 1991; Evans & Coman, 1993; Hermann, 1989; Kroes et al., 1974). Whereas police officers must contend with the usual organisational stressors, they also can experience unique sources of stress. In Study One, the police officers noted the experiences of attending court, delivering death notifications, working with sexual assault victims, and attending serious accidents, as particularly stressful. Three of these work situations were identified in a previous study of Tasmanian police officers (McLaren, 1990). Traffic officers reported the experience of informing someone that a relative had died, as significantly more stressful than any other operational task. Increased stress also was reported to be associated with attending a serious car accident and being confronted in court by a lawyer who aimed to discredit the officer on both a personal and professional level. Therefore, the impact of these occupational tasks warranted further investigation.

It was evident from research emanating from the transactional model of stress (e.g., Folkman, Lazarus, Dunkel-Schetter, et al., 1986; Folkman, Lazarus, Gruen & DeLongis, 1986; Lazarus, 1966; Lazarus & Folkman, 1984) that the ways in which police officers cognitively appraised work situations, and subsequently coped with them, was vital to the understanding of the impact of such events on the officers. Therefore, it was within a transactional model of stress that these three work situations were investigated.

The ways in which police officers cognitively appraised and coped with these aspects of their occupation were investigated in Study Two. Results indicated that the police officers appraised the work situations as challenging and as having to be accepted. During the three encounters, the police officers drew equally on problem- and emotion-focused coping strategies as well as dysfunctional coping strategies. The utilisation of specific coping strategies was, in part, context specific. After the work situations had ended, the police officers relied on emotion-focused coping strategies, particularly acceptance.

While it has been acknowledged that self-report data has provided unique information about the processes of cognitive appraisal and coping, ultimately such information "requires verification by other methods such as observation of direct behavior and physiological assessment" (Folkman, Lazarus, Dunkel-Schetter, et al., 1986, p. 1002). Larsson et al. (1988) also highlighted the limited nature of their self-report data. Within the transactional model of stress, very few researchers have investigated the psychophysiological correlates of appraisal. Research utilising laboratory stressors demonstrated that challenge appraisals were associated with increased HR and threat appraisals were associated with increased self-reported stress (Tomaka et al., 1993) and increased SCL (Lazarus & Alfert, 1964; Speisman et al., 1964). There were no studies that investigated the psychophysiological correlates of cognitive appraisal of work situations.

One aim of this study, therefore, was to investigate the psychophysiological correlates of the police officers' cognitive appraisal of these situations and the coping strategies employed to deal with the situations. On the basis of the previously reviewed literature, it was predicted that challenge appraisals would be associated with increased HR and that threat appraisals would be associated with increased SCL and self-reported stress. Due to the paucity of research on the relationship between specific coping strategies and psychophysiological responses, specific hypotheses could not be predicted, except for social support, which was expected to be related to lower HR.

A further aim of this study was to examine the ways in which the police officers responded psychophysiologically and subjectively to the three operational tasks. Measurement of psychophysiological responses to specific events were seen to present methodological problems when those events did not occur on a regular basis and when the actors in such events would be substantially hampered by the need to make psychophysiological recordings. Further, it has been demonstrated that ambulatory recordings of HR were limited in this type of research (Payne & Rick, 1986), and that HR was very susceptible to abrupt physical activity (Kuorinka & Korhonen, 1981). Additionally, changes in posture have been shown to affect ambulatory recordings of BP (Gellman et al., 1990). Further to these limitations, it appeared impractical to use ambulatory recordings of psychophysiological responses when researchers were interested in investigating the impact of specific work situations on employees. For example, the chances of having a particular police officer monitored when given a death notification appeared rather remote. Indeed, methodological difficulties may be the cause of the paucity of research in this area (McLaren, Haines & Williams, 1996). It was proposed that such difficulties in gaining psychophysiological data in the field, in response to specific stressors, may be addressed through the use of guided imagery. Imagery can be valuable in allowing experimenters to expose subjects to

highly personalised stimuli of the required incidents, while observing psychophysiological response under controlled conditions in the laboratory (Haines et al., 1995).

Lang (1979) has provided the theoretical basis for using imagery to recreate affective states. Emotional imagery has been proposed to be a product of information processed by the brain, and the processing has been defined by measurable input to, and output from, the individual (Lang, Kozak, Miller, Levin & McLean, 1980). Research on guided imagery has indicated that response propositions, as opposed to simply using situational cues, were more effective in demonstrating arousal patterns to experienced events presented during imagery (Acosta & Vila, 1990; Bauer & Craighead, 1979; Hirota & Hirai, 1990; Lang, 1979; Lang et al., 1980; Lang, Levin, Miller & Kozak, 1983). The psychological and psychophysiological responses included in the imagery were only those reported to be experienced during the original incident. The aim of guided imagery was always to measure a realistic approximation of the participant's response during the actual incident; to recreate a psychophysiological memory of the event rather than an artificial response (Haines et al., 1995).

Imagery has been employed to monitor psychophysiological responses in a number of populations, including Vietnam veterans with and without PTSD (Pitman et al., 1990), panic disorder clients (Watkins, Clum, Borden, Broyles & Hayes, 1990), self-mutilators (Brain et al., 1996; Haines et al., 1995), self-poisoners (Driscoll et al., 1996) and individuals with bulimia (Williams et al., 1995).

A four stage methodology of guided imagery has been successfully employed to elicit realistic arousal patterns to real life events (Driscoll et al., 1996; Haines et al., 1995; Williams et al., 1989; Williams et al., 1995). These studies have employed imagery scripts of target behaviours that have been divided into four distinct stages: setting the scene, approach to the behaviour, the actual incident, and

the consequence. To date, this methodology has been used to demonstrate the reinforcement processes of punitive and non-punitive parent-child interactions (Williams et al., 1989), self-mutilation (Brain et al., 1996; Haines et al., 1995), self-poisoning (Driscoll et al., 1996) and the binge-purge cycle of bulimics (Williams et al., 1995). This methodology has not been applied outside the investigation of clinical behaviours, so the current research further investigated the utility of the methodology.

It has been previously noted that one aim of this study was to examine the ways in which police officers respond psychophysiologically and subjectively to three aspects of their occupation. In order to investigate the psychophysiological responding of the police officers to everyday situations, two control situations were included. First, a nonstressful experience of exercising was included to give an indication of arousal in the absence of stress. Second, a nonarousing and nonstressful everyday event, namely making a hot drink or cleaning teeth, was included to give an indication of basic psychophysiological functioning of the participants. The police officers' psychophysiological responses to these control situations were compared to a control group to give an indication of how the police officers responded to normal everyday events. Additionally, it was necessary to compare a stressful experience of the police officers to the control group, to determine if the police officers responded in an aberrant manner to stressful events. Consequently, the police officers' court experience was compared to the controls' experience of a stressful interview. It has been acknowledged that attending court and experiencing an interview were not the same situations. However, it previously has been contended that no perfect control group with an identical experience existed. Further, research has shown that subjecting participants to standard scripts of events they were not familiar with, did not produce realistic psychophysiological arousal patterns that were consistent with script content (Haines et al., 1995).

It was hypothesised that different patterns of subjective and psychophysiological responses would be demonstrated for the work and control situations. Given that little has been documented about the nature of the stress associated with specific work situations, it was hypothesised that for the three work situations, the police officers would respond most strongly to the incident stage. No differentiation was made between the work situations. It also was hypothesised that the police officers' psychophysiological and subjective responses would be higher to the work situations compared to the control situations. Furthermore, it was hypothesised that the police officers and the control group would respond to the common situations in similar ways.

METHOD

8.2.1 Participants

The twenty male police officers and twenty undergraduate students who participated in Study Two also participated in this study. As previously noted, the mean age of the police officers was 30.75 years (SD = 7.85) and the mean age of the controls was 29.75 years (SD = 7.43). The participants were matched for clarity of imagery, assessed by the Betts' Questionnaire Upon Mental Imagery Scale (QMI) (Sheehan, 1967), and for their ability to manipulate imagery, as indexed by the Gordon Test of Visual Imagery Control (Gordon, 1949).

8.2.2 Apparatus

Psychophysiological responses were recorded using Chart 3.4 on a Macintosh IIsi linked to a MacLab/8 Data Acquisition System. Recordings were made at 1 mm/s^{-2}, with a sampling frequency of 200 $samples/s^{-1}$.

The following psychophysiological responses were measured: finger pulse amplitude (FPA), finger blood volume (FBV), electrocardiograph integrated through a cardiotachometer to achieve a mean HR, SCL, EMG from the frontalis muscle, and respiration in breaths per minute (RESP).

A Grass photoelectric finger plethysmograph attached to the middle finger of the participant's non-dominant hand was used to record FBV and FPA. HR was recorded using miniature Gereonics Ag/AgCl electrodes fitted in a standard right rib, left rib placement. An electrode placed on the left mastoid process was used as an earth reference. SCL was measured using two Med Associate 10 mm Ag/AgCl cup electrodes connected to the fingertips of the first and third fingers of the participant's non-dominant hand. The 10 mm diameter of the electrode represented electrode paste (ECI Electro-Gel) contact with the skin. EMG was measured from the frontalis muscle using two miniature Gereonics Ag/AgCl electrodes placed on the left mid-pupillary line at 1/3 and 2/3 above the supra-orbital margin. RESP was measured using a Pneumotrace Respiration Sensor Band fitted around the upper thorax.

8.2.3 Materials

A shortened form of the Betts' QMI (Sheehan, 1967) was used to measure vividness of imagery. The scale consisted of 35 items which assessed general ability to image across various modalities (e.g., olfactory and kinaesthetic). Items were rated on a seven point scale (1 = Perfectly clear and vivid; 7 = No image at all). Lower scores indicated greater clarity of imagery. The Gordon Test of Visual Imagery Control (Gordon, 1949) was used to assess the ability of participants to manipulate and control visual images. The scale consisted of 12 items, and tested participants' ability to manipulate images of a car, including visualising the car in a different colour and in motion. Participants indicated their ability (1 = Yes; 2 = No;

3 = Unsure) to alter the images depicted in each item. Lower scores reflected a greater ability to manipulate imagery.

A Stimulus-Response Inventory (Endler, Hunt & Rosenstein, 1962) was included to quantify each participant's psychophysiological arousal to events which would normally induce anxiety. Six events were included in the inventory, including meeting a new date, giving a speech before a large audience and entering the venue of an important examination. The inventory assessed the awareness of participants to psychophysiological changes within themselves. Such awareness may be the most basic form of appraisal, and therefore important in an investigation of the stress process. This inventory was used to compare the two groups to ensure that their ability to appraise their own arousal levels was similar.

Since stress and arousal have been related to psychophysiological responses (Hutt & Weidner, 1993; Kelsey, 1991; Matthews, Jones & Chamberlain, 1990; Rouselle, Blascovich & Kelsey, 1995; Senkfor & Williams, 1995; Tarrant, Manfredo & Driver, 1994; Totten & France, 1995; Uchino et al., 1995), measures of participants' levels of stress and arousal were taken prior to script presentation. The short form of the Stress/Arousal Checklist (SACL) (King, Burrows & Stanley, 1983) was used to assess state levels of stress and arousal prior to the presentation of the first script. The SACL comprised 10 items measuring stress and 10 items measuring arousal. The items consisted of adjectives describing each dimension, including calm, contented, active and vigorous. Cronbach's alpha coefficients for the stress and arousal scales have been reported as .86 and .74, respectively. The Perceived Stress Scale (PSS) (Cohen, Kamarck & Mermelstein, 1983) was employed to assess stress levels for the month preceding the laboratory session of each participant. The 14 items examined how often the participants felt or behaved in certain ways, including feeling in control of their life, feeling upset and coping successfully with daily hassles. Alpha coefficient reliabilities of .84,

.85 and .86 have been demonstrated for three different samples (Cohen et al., 1983).

Visual Analogue Scales (VASs) measured a number of feelings/emotions associated with the content of each stage of the imagery script (Relaxed/Tense; Calm/Angry; Unafraid/Afraid; Happy/Sad; Normal/Numb; Normal/Unreal). As previously noted, VASs have been demonstrated to be highly sensitive and reliable, and are suitable for frequent and repeated measurement (McCormack et al., 1988). The VASs were measured on a 100 point scale, with higher scores signifying a more negative feeling.

Two control VASs were included in the study. A Clear/Unclear VAS was used to assess clarity of imagery during the laboratory session, and a Close/Not Close VAS assessed the closeness of script content to reality. The VASs were measured on a 100-point scale, with higher scores indicating clearer imagery and a closer approximation to reality.

The police officers' responses on the scales measuring cognitive appraisal, coping during and after each work situation, and satisfaction with outcome from Study Two, were included in this study.

Copies of the materials are presented in Appendix F.

8.2.4 Imagery scripts

The police officers were interviewed about five situations: attending a serious car accident, delivering a death notification, a stressful court experience, a time they had exercised (must not have been stressful), and a neutral event (e.g., making a cup of coffee). The control group were interviewed about a stressful interview, a non-stressful period of exercise, and a neutral event.

Participants were requested to describe each situation in terms of their environment, their behaviours, and their emotional and psychophysiological

responses. The information was limited to the minutes surrounding the allocation of the task, the minutes prior to arriving at the scene, the minutes of the main task, and the minutes surrounding leaving the scene of the task. Participants were in no way pressured to report information that could not be adequately recalled.

Imagery scripts were composed using a combination of response and stimulus information as reported by individual participants (Lang, 1979). Consistent with Haines et al. (1995), scripts were constructed using the wording of participants, and no participant was instructed to experience any responses not reported previously. Each script was constructed using four distinct stages: Stage 1: setting the scene (a description of the environment and the receiving of the task); Stage 2: the approach to the situation (a description of events leading up to the incident); Stage 3: the actual incident (a description of the behaviours and responses to the situation); and Stage 4: the consequences of the situation (a description of responses to the event and the specific behaviours performed after the incident, including leaving the scene of the event).

Examples of typical scripts of each type are included in Appendix G. Actual scripts have not been included because of ethical reasons.

8.2.5 Procedure

The tape-recorded interviews from Study Two were utilised in this study. In these interviews, the police participants were asked about a court experience, a serious car accident and a death notification. The control participants were asked about a stressful interview. In a second interview, the police and control participants were interviewed about a time they had exercised and a neutral event. As much detail as possible was elicited from the participants, including visual, auditory and physiological memories of each particular event. From these

interviews, individualised scripts were developed. The scripts contained only those stimulus details and responses mentioned by the participant.

Participants then attended a single laboratory session. After being fitted with electrodes, participants were instructed to relax for ten minutes. The first baseline psychophysiological recordings were taken. Baseline recordings were taken prior to each script presentation. Each of the experimental scripts was presented in a counterbalanced order. Each stage followed on from the previous stage, without a return to baseline, to allow for the gradual and realistic build-up of the scene over the four stages. After each script, VASs were completed in relation to each stage. To facilitate the self-report ratings, the key elements in each stage were repeated prior to ratings for that stage.

8.2.6 Design

Initially, a 2 x 3 x 4 factorial design was employed. This series of group (police officers, control) x script (court/interview, exercise, neutral) x stage (scene setting, approach, incident, consequence) designs were employed to determine if differences existed between the police officers and control participants in their psychophysiological and subjective responses to stressful and nonstressful situations. Secondly, a 5 x 4 factorial design was employed. This series of script (car accident, death notification, court, exercise, neutral) x stage (scene setting, approach, incident, consequence) designs were used to determine the impact of these situations on the psychophysiological and subjective responses of the police officers. The dependent variables were the psychophysiological responses (HR, SCL, FPA, FBV, EMG, RESP) and the subjective responses (VASs: Relaxed/Tense, Calm/Angry, Unafraid/Afraid, Happy/Sad, Normal/Numb, Normal/Unreal).

8.2.7 Data transformation and scoring

Mean scores were taken from a 30 second period within each stage of each script, and represented the part of each stage containing the most relevant information for each participant. A standard scoring period could not be used because the scripts were personalised, and some variation between participants existed. Consequently, there needed to be some flexibility in scoring the scripts, although the scoring period was usually near the end of the stage.

Change scores were calculated for each psychophysiological measure. Whereas change scores were necessary for the vasomotor measurements (FBV and FPA) due to the relative nature of these responses (Stern et al., 1980), change scores were calculated for all psychophysiological responses to maintain consistency. Change scores reflected the degree of reactivity to the script stages by calculating the difference between baseline scores and average response scores elicited throughout each script stage. Positive change scores reflected an increase in arousal from baseline, whereas negative change scores reflected a decrease in arousal compared to baseline.

8.2.8 Data analysis

A significance criterion of .05 was adopted for all analyses and a Huynh-Feldt correction was applied to all ANOVAs. All analyses were two-tailed. Repeated-measures ANOVAs were employed to test for differences between the two groups in their psychophysiological and subjective responses to stressful and nonstressful situations. Additional ANOVAs were used to determine the impact of the five events on the psychophysiological and subjective responses of the police officers. Means comparisons, as calculated by SuperANOVA (Abacus Concepts, 1989), were employed to test for significant differences between the levels of

variables in significant interactions and main effects. Although the number of ANOVAs was large, the ratio of participants to dependent variables precluded the use of multivariate ANOVAs (Tabachnick & Fidell, 1989).

In order to investigate the psychophysiological and subjective correlates of the cognitive appraisal, coping and outcome variables, Pearson correlation coefficients were calculated between these variables and the police officers' psychophysiological and subjective responses to the incident stage (Stage 3) of the imagery. All tests were two-tailed. As noted in Study Two, whereas the large number of correlations may inflate the Type 1 error rate, the exploratory nature of this aspect of the research called for less conservative alpha levels. The correlations significant at .05 may be interpreted cautiously as trends.

RESULTS

All ANOVAs were run using SuperANOVA (Abacus Concepts, 1989). Pearson correlation coefficients were calculated using StatView (Abacus Concepts, 1992).

There were no significant differences between the two groups in their clarity of imagery, $F(1, 38) = .00$, $p > .05$, as assessed by the Betts' QMI, or in their ability to manipulate their imagery, $F(1, 38) = 1.42$, $p > .05$, as indexed by the Gordon Test of Visual Imagery Control. Mean scores and standard deviations for both groups on the two imagery scales are presented in Table 17.

Table 17. Mean scores and standard deviations for the Betts' QMI and Gordon Test of Visual Imagery Control for both groups.

	Police	Controls
Betts' QMI		
M	84.45	84.75
SD	16.87	16.74
Gordon		
M	16.10	14.70
SD	4.09	3.29

Mean scores and standard deviations for both groups on the Stimulus-Response Inventory are presented in Table 18. No significant differences were detected between the two groups on the total score of the Stimulus-Response Inventory, $F(1, 38) = .01$, $p > .05$, or on the subscales of the inventory, specifically heart racing, $F(1, 38) = .94$, $p > .05$, uneasy feeling, $F(1, 38) = .59$, $p > .05$, exhilarated and thrilled feeling, $F(1, 38) = .09$, $p > .05$, perspiration, $F(1, 38) = .06$, $p > .05$, urinate more frequently, $F(1, 38) = 1.61$, $p > .05$, dry mouth, $F(1, 38) = .56$, $p > .05$, full feeling in stomach, $F(1, 38) = 3.48$, $p > .05$, loose bowels, $F(1, 38) = .29$, $p > .05$, and experience nausea, $F(1, 38) = .02$, $p > .05$. Thus, both groups were equally aware of their psychophysiological responses to stressful situations, and their perception of intensity of responses were similar.

Mean scores and standard deviations for the Stress/Arousal Checklist and Perceived Stress Scale are presented in Table 19. There were no significant differences prior to script presentation between the police officers and the control group for stress, $F(1, 38) = .00$, $p > .05$, or arousal, $F(1, 38) = 2.38$, $p > .05$, nor for levels of stress for the month prior to the laboratory session, $F(1, 38) = .61$, $p > .05$.

Table 18. Mean scores and standard deviations for the Stimulus-Response Inventory for both groups.

	Police	Controls
Heart		
M	23.50	22.40
SD	2.50	4.42
Uneasy		
M	21.65	20.65
SD	3.73	4.46
Thrilled		
M	16.85	17.25
SD	3.22	5.23
Perspire		
M	15.50	15.95
SD	5.19	6.34
Urinate		
M	10.15	12.00
SD	4.12	5.07
Mouth		
M	14.25	15.60
SD	4.70	6.55
Stomach		
M	14.75	11.35
SD	6.20	5.29
Loose Bowels		
M	8.15	8.85
SD	4.10	4.07
Nausea		
M	10.50	10.30
SD	3.99	4.99
Total		
M	135.30	134.35
SD	24.99	32.30

Table 19. Mean scores and standard deviations for stress and arousal levels prior to script presentation.

	Police	Controls
Stress		
M	3.45	3.40
SD	2.52	2.60
Arousal		
M	2.50	3.90
SD	2.37	3.29
Perceived Stress Scale		
M	21.05	22.45
SD	6.29	5.00

8.3.1 Response to imagery

Mean ratings and standard deviations of the Clear/Unclear and Close/Not Close VASs are presented in Table 20. No group differences where demonstrated for clarity of imagery, $F(1, 38) = .20$, $p > .05$, or for closeness of imagery to reality, $F(1, 38) = .88$, $p > .05$. The means and standard deviations for these two VASs for each stage of each script for both groups are presented in Appendix H. No group differences were demonstrated for script, stage or an interaction between stage and script. However, main effects for script were evident for Close/Not Close, $F(2, 76) = 4.00$, $p < .03$, and for Clear/Unclear, $F(2, 76) = 5.32$, $p < .01$. For Close/Not Close, neutral scripts were rated higher than the court/interview, $F(1, 76) = 6.34$, $p < .02$, and exercise scripts, $F(1, 76) = 5.80$, $p < .02$. For Clear/Unclear, the neutral script was rated higher than the court script, $F(1, 76) = 10.66$, $p < .003$, and there was a trend for the exercise script to be rated higher than the court/interview script, $F(1, 76) = 3.68$, $p = .061$. A main effect for stage was demonstrated for Clear/Unclear, $F(3, 114) = 3.70$, $p < .02$. Stage 4 was rated higher than Stage 1, $F(1, 114) = 4.67$, $p < .04$, and Stage 2, $F(1, 114) = 10.48$, $p < .002$. There were no main effects or interactions demonstrated when the five police scripts were compared.

Table 20. Mean ratings and standard deviations for clarity of imagery and closeness to reality for both groups.

	Police	Controls
Clarity		
M	84.14	82.22
SD	16.44	18.18
Close		
M	79.58	83.85
SD	21.73	13.34

The means and standard deviations of the psychophysiological responses of both groups to each stage of each script are presented in Table 21 and the subjective responses are presented in Table 22. The complexity of the tables prevented any indication of significant results to be included. All significant results have been described in the text.

8.3.2 Comparison of groups

Psychophysiological Responses to Scripts

Prior to examining the ways in which police officers responded to stressful work situations, it was necessary to investigate whether they reacted to stressful and nonstressful situations in the same ways as people not involved in police work. It was predicted there would be no differences between the two groups on the two control scripts (exercise and neutral) or on the stressful script (court/interview).

Group differences were established for HR, SCL and RESP. The main effect for HR demonstrated higher overall HR change scores for the controls compared to the police officers, $F(1, 38) = 4.87$, $p < .04$.

A group by stage interaction was demonstrated for SCL, $F(3, 114) = 6.27$, $p < .005$. There were significant differences between the two groups for each stage of imagery, $F(1, 118) = 11.64$, $p < .001$ (Stage 1), $F(1, 118) = 24.63$, $p < .001$ (Stage 2), $F(1, 118) = 23.99$, $p < .001$ (Stage 3), $F(1, 118) = 20.71$, $p < .001$ (Stage 4). For the police, SCL decreased across stages. SCL change scores were smaller during Stage 1 compared to Stage 2, $F(1, 177) = 14.17$, $p < .002$, Stage 3, $F(1, 177) = 21.37$, $p < .001$, and Stage 4, $F(1, 177) = 46.49$, $p < .001$. Change scores for Stage 2, $F(1, 177) = 9.33$, $p < .007$, and Stage 3, $F(1, 177) = 4.82$, $p < .05$, were smaller than the change scores for Stage 4. SCL increased across Stages 1 to 3 for the controls, and decreased in Stage 4.

Table 21. Mean change scores and standard deviations on the psychophysiological measures for each stage of each script for both groups.

	Car Accident				Death Notification				Court/Interview				Exercise				Neutral			
Group	Scene	App	Inc	Cons	Scene	App	Inc	Cons	Scene	App	Inc	Cons	Scene	App	Inc	Cons	Scene	App	Inc	Cons
										FBV										
Police																				
M	0.10	0.10	0.09	0.04	0.06	0.07	0.09	-0.06	0.07	0.05	0.13	0.10	-0.04	-0.03	-0.06	-0.07	-0.03	-0.06	-0.23	-0.19
SD	0.25	0.34	0.44	0.39	0.30	0.46	0.55	0.79	0.32	0.53	0.79	0.89	0.31	0.37	0.32	0.44	0.23	0.18	0.54	0.44
Control																				
M									0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.02	0.00
SD									0.02	0.03	0.04	0.04	0.02	0.04	0.05	0.06	0.01	0.02	0.03	0.09
										FPA										
Police																				
M	0.31	0.29	0.23	0.15	0.20	0.19	0.25	0.17	0.30	0.30	0.36	0.16	0.01	-0.01	-0.06	-0.17	-0.08	-0.14	-0.50	-0.13
SD	0.22	0.20	0.25	0.27	0.34	0.41	0.29	0.44	0.26	0.27	0.24	0.45	0.29	0.27	0.35	0.52	0.43	0.39	1.12	0.45
Control																				
M									0.21	0.15	0.12	-0.05	0.11	-0.01	-0.03	-0.09	-0.13	-0.15	-0.15	-0.16
SD									0.19	0.32	0.31	0.41	0.20	0.47	0.61	0.78	0.21	0.24	0.26	0.24
										HR										
Police																				
M	3.64	2.87	3.24	2.40	3.39	3.10	3.46	2.67	3.39	2.87	3.77	3.49	1.98	1.90	1.52	1.18	-0.22	-0.03	0.19	-0.17
M	3.23	3.39	2.97	3.12	3.70	3.40	4.29	3.25	2.66	2.69	3.18	3.43	2.78	2.33	3.07	3.33	3.19	3.02	3.02	3.27
Control																				
M									4.06	5.59	5.04	5.14	2.19	2.24	2.71	2.12	1.09	1.88	1.92	1.68
SD									3.77	3.72	3.38	2.69	3.50	2.60	2.77	3.27	3.11	3.56	3.23	4.21

Table 21 continued

									EMG										
Police																			
M	0.20	0.47	0.64	0.83	0.73	0.97	1.51	1.55	0.22	0.99	0.86	0.76	0.01	0.15	0.32	0.48	-0.06	0.11	0.18	0.14
SD	1.20	1.25	1.18	1.34	1.03	1.44	1.95	1.81	0.98	1.72	0.84	1.14	0.38	0.58	0.69	0.79	0.41	0.53	0.59	0.78
Control																			
M									0.11	0.35	0.65	0.43	0.11	0.03	0.10	0.07	0.25	0.16	0.23	-0.01
SD									0.42	1.06	1.54	1.46	0.64	1.11	1.62	2.00	1.11	1.13	1.42	1.01
									RESP										
Police																			
M	3.12	4.01	4.59	3.54	3.46	5.36	4.36	4.14	2.79	2.88	5.37	2.16	3.14	3.70	3.62	2.37	1.58	1.04	1.29	1.81
SD	1.88	2.67	3.31	2.96	3.19	4.37	3.07	5.90	3.42	3.22	5.23	3.57	3.13	2.51	2.44	2.49	2.21	2.10	2.50	1.55
Control																			
M									3.21	4.36	3.98	3.55	2.08	2.71	3.54	3.57	0.98	1.35	1.76	1.73
SD									2.69	3.29	3.36	3.29	1.79	2.01	3.52	2.80	1.64	1.76	1.79	1.83
									SCL										
Police																			
M	-0.63	-1.24	-1.76	-1.54	-0.77	-1.74	-2.02	-2.64	-0.34	-1.19	-0.98	-1.53	-0.69	-1.05	-1.40	-1.75	-1.20	-2.50	-2.94	-3.51
SD	2.14	2.48	3.12	2.83	1.62	2.59	3.33	3.39	2.06	2.74	3.21	3.22	1.39	2.29	3.07	3.24	1.85	2.64	2.79	2.70
Control																			
M									0.55	1.15	1.17	0.51	0.13	0.48	0.97	0.81	0.31	0.31	0.32	-0.45
SD									1.60	2.21	1.92	2.36	1.55	1.92	2.64	3.00	1.83	2.76	3.36	3.52

Note: Scene = setting the scene (Stage 1); App = approach (Stage 2); Inc = incident (Stage 3); Cons = consequence (Stage 4); FBV = finger blood volume (in millivolts); FPA = finger pulse amplitude (in millivolts); HR = heart rate (in beats per minute); EMG = electromyography (in microvolts); RESP = respiration (in breaths per minute); SCL = skin conductance level (in micro mho)

Table 22. Mean ratings and standard deviations on the subjective measures for each stage of each script for both groups.

	Car Accident				Death Notification				Court/Interview				Exercise				Neutral			
Group	Scene	App	Inc	Cons	Scene	App	Inc	Cons	Scene	App	Inc	Cons	Scene	App	Inc	Cons	Scene	App	Inc	Cons
									Relaxed/Tense											
Police																				
M	60.75	81.75	80.25	72.30	68.25	80.85	79.20	49.40	80.55	83.80	89.60	35.75	27.40	27.45	54.70	28.85	12.60	13.80	14.60	12.05
SD	24.91	16.63	17.75	25.23	24.39	12.15	28.38	31.40	16.37	16.82	8.71	27.31	25.19	21.02	28.07	24.92	17.04	17.79	18.43	17.07
Control																				
M									64.35	72.25	77.85	48.35	37.20	35.15	51.55	39.50	19.45	20.35	20.50	17.35
SD									21.73	22.69	17.57	22.45	24.10	24.21	23.94	21.41	16.46	14.01	19.69	15.48
									Calm/Angry											
Police																				
M	53.05	66.95	66.85	64.15	58.15	65.50	64.80	41.80	59.55	62.05	83.10	50.60	19.85	22.60	46.15	18.95	12.00	10.10	14.25	10.35
SD	24.94	24.23	21.96	30.21	27.09	19.44	26.67	27.72	24.63	25.06	16.03	32.96	21.31	19.61	28.69	17.91	15.23	8.43	15.44	10.64
Control																				
M									47.15	50.00	56.95	46.60	24.50	24.00	34.15	28.10	14.15	17.50	16.35	14.70
SD									18.60	23.86	28.64	27.41	21.61	20.34	21.18	18.93	12.78	14.14	14.07	11.37
									Happy/Sad											
Police																				
M	55.40	66.65	69.30	69.80	64.15	71.45	78.95	59.40	54.85	59.75	63.20	30.95	18.95	19.05	29.40	9.95	18.10	18.65	16.65	15.65
SD	17.93	21.86	25.18	23.58	20.08	17.15	21.68	28.56	11.25	16.57	16.99	28.54	16.97	16.34	21.73	8.19	18.78	14.21	16.79	13.96
Control																				
M									49.35	53.00	54.10	43.85	25.30	27.70	27.80	19.25	26.90	26.95	25.90	18.35
SD									17.34	18.33	18.09	27.39	19.59	18.94	17.90	14.44	18.11	15.82	16.04	14.49

Table 22 continued

	Unafraid/Afraid																			
Police																				
M	46.30	60.45	54.30	47.65	46.85	60.05	53.65	28.20	62.40	67.55	69.25	31.15	16.30	17.50	19.30	13.95	7.75	9.50	9.00	8.35
SD	27.93	26.62	27.76	29.50	28.85	26.16	33.08	27.31	25.90	25.61	21.19	27.15	21.22	17.32	20.02	15.37	7.80	7.50	7.40	5.99
Control																				
M									59.15	59.15	66.20	40.35	21.45	24.55	21.25	14.15	12.40	14.90	18.10	12.20
SD									20.55	22.78	21.54	24.97	22.83	23.35	21.46	17.32	12.56	15.65	20.43	14.52
	Normal/Numb																			
Police																				
M	42.90	59.15	60.35	52.65	51.80	60.70	59.85	44.90	52.00	59.95	61.60	48.50	17.65	18.30	30.60	23.55	11.65	13.80	13.60	13.95
SD	25.07	26.05	25.34	28.08	27.44	25.11	27.79	30.90	25.87	24.20	25.90	27.76	20.41	20.81	26.97	22.47	15.13	14.22	11.10	13.93
Control																				
M									38.05	37.40	46.35	40.00	19.25	21.20	26.85	23.75	18.20	18.70	17.65	12.70
SD									27.90	27.44	27.87	31.28	20.21	21.28	24.83	23.69	20.99	21.51	18.03	11.94
	Normal/Unreal																			
Police																				
M	45.45	57.95	60.40	54.45	52.30	61.00	63.40	48.70	49.95	59.20	62.45	54.40	15.90	18.80	29.10	26.50	11.70	12.55	15.35	13.60
SD	25.72	25.03	26.12	29.47	26.53	24.99	26.97	31.59	24.55	20.56	23.98	28.93	17.89	20.42	25.61	25.68	14.39	12.65	17.17	12.96
Control																				
M									43.55	41.40	46.95	39.05	17.80	18.25	28.25	20.30	15.80	15.20	15.00	13.60
SD									26.83	28.92	26.42	26.64	16.78	17.20	23.77	21.79	16.94	14.79	12.58	12.84

Note: Scene = setting the scene (Stage 1); App = approach (Stage 2); Inc = incident (Stage 3); Cons = consequence (Stage 4)

Change scores were greater in Stage 3 compared to Stage 1, $F(1, 177) = 5.31$, $p < .04$, and Stage 4, $F(1, 177) = 6.22$, $p < .03$.

The final group differences for psychophysiological responses to the imagery were shown for RESP. A group by script by stage interaction, $F(6, 228) = 3.17$, $p < .02$, demonstrated different patterns of arousal for the two groups, rather than different levels of arousal. For the court script, RESP increased significantly from Stage 1 to Stage 3, $F(1, 114) = 15.38$, $p < .003$, and from Stage 2 to Stage 3, $F(1, 114) = 14.31$, $p < .003$, and then decreased from Stage 3 to Stage 4, $F(1, 114) = 23.79$, $p < .001$. This pattern of arousal was not evident for the control subjects, $F(1, 114) = 1.32$, $p > .05$. There also was an interaction between group and stage, $F(3, 114) = 3.50$, $p < .03$. Analyses indicated no significant differences between the two groups on any of the stages, but demonstrated differences in arousal patterns across the stages. For the police, change scores were greater during Stage 3 compared to Stage 1, $F(1, 57) = 6.86$, $p < .03$, Stage 2, $F(1, 57) = 6.34$, $p < .03$, and Stage 4, $F(1, 57) = 13.87$, $p < .003$. For the controls, change scores were significantly lower in Stage 1 compared to Stage 2, $F(1, 57) = 7.40$, $p < .01$, Stage 3, $F(1, 57) = 15.07$, $p < .001$, and Stage 4, $F(1, 57) = 10.81$, $p < .003$.

A main effect for script was shown for RESP, $F(2, 76) = 11.51$, $p < .001$. Higher arousal was evident for the court/interview scripts, $F(1, 76) = 20.80$, $p < .001$, and the exercise script, $F(1, 76) = 12.75$, $p < .001$, compared to the neutral script. A main effect was demonstrated for stage, $F(3, 114) = 7.04$, $p < .001$. Results indicated that change scores were greater in Stage 3 compared to Stage 1, $F(1, 114) = 18.02$, $p < .001$, Stage 2, $F(1, 114) = 6.98$, $p < .02$, and Stage 4, $F(1, 114) = 10.78$, $p < .003$. An interaction between stage and script was demonstrated, $F(6, 228) = 2.44$, $p < .05$. Since the script by stage interaction for these three scripts was not central to the study, the means comparisons have not been included. However, the results of these analyses are included in Appendix I.

Appendix I contains the means comparisons for all significant script by stage interactions for the three scripts.

A main effect for script was evident for SCL, $F(2, 76) = 5.47$, $p < .007$. Analyses indicated higher arousal for the court/interview scripts, $F(1, 76) = 9.81$, $p < .003$, and the exercise script, $F(1, 76) = 6.17$, $p < .02$, compared to the neutral script. A main effect for stage was noted, $F(1, 76) = 5.29$, $p < .002$. Results demonstrated significantly more change from baseline during Stage 4 compared to Stage 1, $F(1, 117) = 23.79$, $p < .001$, Stage 2, $F(1, 117) = 10.60$, $p < .005$, and Stage 3, $F(1, 117) = 10.13$, $p < .006$. A script by stage interaction was shown for SCL, $F(6, 228) = 3.57$, $p < .002$.

A main effect for script was evident for FPA, $F(2, 76) = 15.20$, $p < .001$. There was elevated arousal for the court/interview scripts compared to the exercise script, $F(1, 76) = 10.64$, $p < .001$, and the neutral script, $F(1, 76) = 30.04$, $p < .001$. Higher arousal was evident for the exercise script compared to the neutral script, $F(1, 76) = 4.92$, $p < .05$. There was a main effect for stage, $F(3, 114) = 4.63$, $p < .01$. Results demonstrated significant differences between arousal in Stage 1 and the decreased arousal in Stage 3, $F(1, 114) = 7.47$, $p < .02$, and Stage 4, $F(1, 114) = 11.54$, $p < .003$. A similar difference in arousal was noted between Stage 2 and Stage 4, $F(1, 114) = 4.86$, $p < .04$. There was a significant interaction between script and stage for FPA, $F(6, 228) = 2.91$, $p < .05$.

A main effect for script was demonstrated for HR, $F(2, 76) = 20.02$, $p < .001$. Change scores were higher for court/interview compared to exercise, $F(1, 76) = 16.35$, $p < .001$, and neutral, $F(1, 76) = 38.90$, $p < .001$, and were higher for exercise compared to neutral, $F(1, 76) = 4.81$, $p < .04$.

A script main effect also was demonstrated for EMG, $F(2, 76) = 8.89$, $p < .001$. Change scores for the court/interview script were greater than the change

scores for exercise, $F(1, 76) = 12.22$, $p < .001$, and neutral, $F(1, 76) = 14.36$, $p < .001$.

To summarise these results, three group differences in psychophysiological responses to the imagery were established. HR demonstrated an overall difference, with the controls having higher change scores than the police. SCL indicated a different pattern of responding across the stages for the two groups. The police officers' SCL decreased across stages, whereas the controls' SCL increased across stages. RESP demonstrated a different pattern of responding for the stressful script. Whereas significant differences were noted across the stages of the court script, arousal remained constant across the stages of the interview script. Thus, there were differences between the two groups in terms of intensity of responding and in terms of arousal patterns in response to the stressful situation. There were no results indicating the police officers responded differently to the control imagery compared to the control group.

Comparison of Subjective Responses

Analyses of the subjective responses to imagery indicated several group differences. A group by script by stage interaction was demonstrated for Relaxed/Tense, $F(6, 228) = 2.78$, $p < .02$, and Happy/Sad, $F(6, 228) = 3.55$, $p < .006$. The police officers felt significantly more tense during Stage 1, $F(1, 38) = 7.09$, $p < .05$, and Stage 3, $F(1, 38) = 7.18$, $p < .05$, of the court script compared to the controls during those stages of the interview script. Higher ratings on the Happy/Sad VAS were evident for the controls during Stage 4 of the exercise script compared to the police officers, $F(1, 38) = 6.28$, $p < .02$.

Group by script interactions were demonstrated for Calm/Angry, $F(2, 76) = 5.08$, $p < .02$, and for Normal/Numb, $F(2, 76) = 4.00$, $p < .04$. The police officers rated themselves as significantly more angry during their court script compared to the controls during their interview script, $F(1, 38) = 5.04$, $p < .04$.

There was a trend for this same difference to be evident for feelings of numbness, $F(1, 38) = 3.84$, $p = .058$.

Group by stage interactions were shown for Relaxed/Tense, $F(3, 114) = 3.10$, $p < .001$, and for Calm/Angry, $F(3, 114) = 4.11$, $p < .02$. Higher ratings of anger were evident during Stage 3 of imagery for the police group, $F(1, 114) = 4.37$, $p < .04$. The control group reported higher ratings of tension during Stage 4 of imagery, $F(1, 114) = 4.62$, $p < .04$.

Interactions between script and stage were demonstrated for five of the six subjective measures, $F(6, 228) = 20.37$, $p < .001$ (Relaxed/Tense), $F(6, 228) = 4.97$, $p < .001$ (Calm/Angry), $F(6, 228) = 14.74$, $p < .001$ (Unafraid/Afraid), $F(6, 228) = 4.34$, $p < .002$ (Happy/Sad), $F(6, 228) = 2.55$, $p < .04$ (Normal/Numb). Means comparisons for these interactions are included in Appendix I.

Main effects for script were established for all subjective measures, $F(2, 76) = 135.25$, $p < .001$ (Relaxed/Tense), $F(2, 76) = 112.84$, $p < .001$ (Calm/Angry), $F(2, 76) = 129.72$, $p < .001$ (Unafraid/Afraid), $F(2, 76) = 76.06$, $p < .001$ (Happy/Sad), $F(2, 76) = 48.16$, $p < .001$ (Normal/Numb), $F(2, 76) = 63.10$, $p < .001$ (Normal/Unreal). For Relaxed/Tense, the court/interview experience was rated as producing significantly more tension than exercise, $F(1, 76) = 94.52$, $p < .001$, and neutral, $F(1, 76) = 267.30$, $p < .001$. Exercise was rated higher than neutral, $F(1, 76) = 43.92$, $p < .001$. Similar results were demonstrated for Calm/Angry, with court/interview being rated significantly higher than exercise, $F(1, 76) = 101.47$, $p < .001$, and neutral, $F(1, 76) = 215.74$, $p < .001$, and exercise being higher than neutral, $F(1, 76) = 21.30$, $p < .001$. Ratings on the Unafraid/Afraid VAS were higher for court/interview compared to exercise, $F(1, 76) = 159.88$, $p < .001$, and neutral, $F(1, 76) = 223.90$, $p < .001$, and higher for exercise compared to neutral, $F(1, 76) = 5.38$, $p < .03$. Normal/Numb ratings were higher for court/interview than exercise, $F(1, 76) = 51.95$, $p < .001$, and

neutral, $F(1, 76) = 87.85$, $p < .001$, and for exercise compared to neutral, $F(1, 76) = 4.69$, $p < .05$. A similar result was shown for Normal/Unreal, with court/interview being higher than exercise, $F(1, 76) = 69.70$, $p < .001$, and neutral, $F(1, 76) = 114.14$, $p < .001$, and exercise being higher than neutral, $F(1, 76) = 5.45$, $p < .03$. For Happy/Sad, court/interview was higher than exercise, $F(1, 76) = 109.04$, $p < .001$, and neutral, $F(1, 76) = 118.91$, $p < .001$.

Main effects for the stage of script were indicated for all subjective measures, $F(3, 114) = 32.01$, $p < .001$ (Relaxed/Tense), $F(3, 114) = 15.35$, $p < .001$ (Calm/Angry), $F(3, 114) = 27.95$, $p < .001$ (Unafraid/Afraid), $F(3, 114) = 20.48$, $p < .001$ (Happy/Sad), $F(3, 114) = 7.09$, $p < .002$ (Normal/Numb), $F(3, 114) = 8.78$, $p < .001$ (Normal/Unreal). For Relaxed/Tense, Stage 3 was rated higher than Stage 1, $F(1, 114) = 26.81$, $p < .001$, Stage 2, $F(1, 114) = 18.59$, $p < .001$, and Stage 4, $F(1, 114) = 95.24$, $p < .001$. Stage 4 was rated significantly lower than Stage 1, $F(1, 114) = 20.99$, $p < .001$, and Stage 2, $F(1, 114) = 29.68$, $p < .001$. For Calm/Angry, Stage 3 was rated higher than Stage 1, $F(1, 114) = 29.96$, $p < .001$, Stage 2, $F(1, 114) = 23.06$, $p < .001$, and Stage 4, $F(1, 114) = 36.72$, $p < .001$. For Unafraid/Afraid, Stage 3 was rated higher than Stage 1, $F(1, 114) = 5.66$, $p < .04$, and Stage 4, $F(1, 114) = 69.63$, $p < .001$. Stage 2 was rated higher than Stage 4, $F(1, 114) = 53.93$, $p < .001$. For Happy/Sad, ratings of Stage 4 were significantly lower than ratings for Stage 1, $F(1, 114) = 25.77$, $p < .001$, Stage 2, $F(1, 114) = 37.74$, $p < .001$, and Stage 3, $F(1, 114) = 52.37$, $p < .001$. Ratings on the VAS Normal/Numb were higher during Stage 3 compared to Stage 1, $F(1, 114) = 18.05$, $p < .001$, Stage 2, $F(1, 114) = 8.47$, $p < .02$, and Stage 4, $F(1, 114) = 13.30$, $p < .002$. For Normal/Unreal, ratings were higher for Stage 3 compared to Stage 1, $F(1, 114) = 23.89$, $p < .001$, Stage 2, $F(1, 114) = 13.35$, $p < .002$, and Stage 4, $F(1, 114) = 11.68$, $p < .004$.

To summarise these results, a number of group differences in subjective response were noted, with the police officers reporting significantly more negative

feelings associated with the court script, particularly during Stage 3 of that script, compared to the control group. There were other main effects and interactions noted, most of which highlighted variations in subjective responses to each script, and to the stages of the scripts, rather than demonstrating differences between the groups. In particular, it was demonstrated that the court/interview scripts were rated significantly higher than the two control scripts, and Stage 3 was rated significantly higher than the other three stages of imagery.

8.3.3 Police group

Comparison of Psychophysiological Responses to Scripts

For the police officers, the three work scripts were compared to the two control scripts. Results demonstrated significant effects for five of the six psychophysiological dependent variables.

A stage by script interaction was demonstrated for RESP, $F(12, 228) = 2.35$, $p < .05$. The interaction is presented in Figure 1. Stage 1 of the neutral script was significantly less arousing than Stage 1 of the death notification script, $F(1, 228) = 7.39$, $p < .03$. Stage 2 of the death notification script was more arousing than Stage 2 of the exercise script, $F(1, 228) = 5.75$, $p < .05$, court script, $F(1, 228) = 12.90$, $p < .007$, and neutral script, $F(1, 228) = 39.09$, $p < .001$. Stage 2 of the neutral script was less arousing than Stage 2 of the accident script, $F(1, 228) = 18.41$, $p < .002$, the court script, $F(1, 228) = 7.08$, $p < .03$, and the exercise script, $F(1, 228) = 14.86$, $p < .004$. Stage 3 of the court script was more arousing than Stage 3 of the exercise script, $F(1, 228) = 6.39$, $p < .04$, and the neutral script, $F(1, 228) = 34.69$, $p < .001$. Stage 3 of the neutral script was less arousing than Stage 3 of the accident, $F(1, 228) = 22.63$, $p < .001$, death notification, $F(1, 228) = 19.57$, $p < .002$, court, $F(1, 228)$, $= 34.69$, $p < .001$, and exercise scripts, $F(1, 228) = 11.31$, $p < .01$. During Stage 4, the death notification script was more

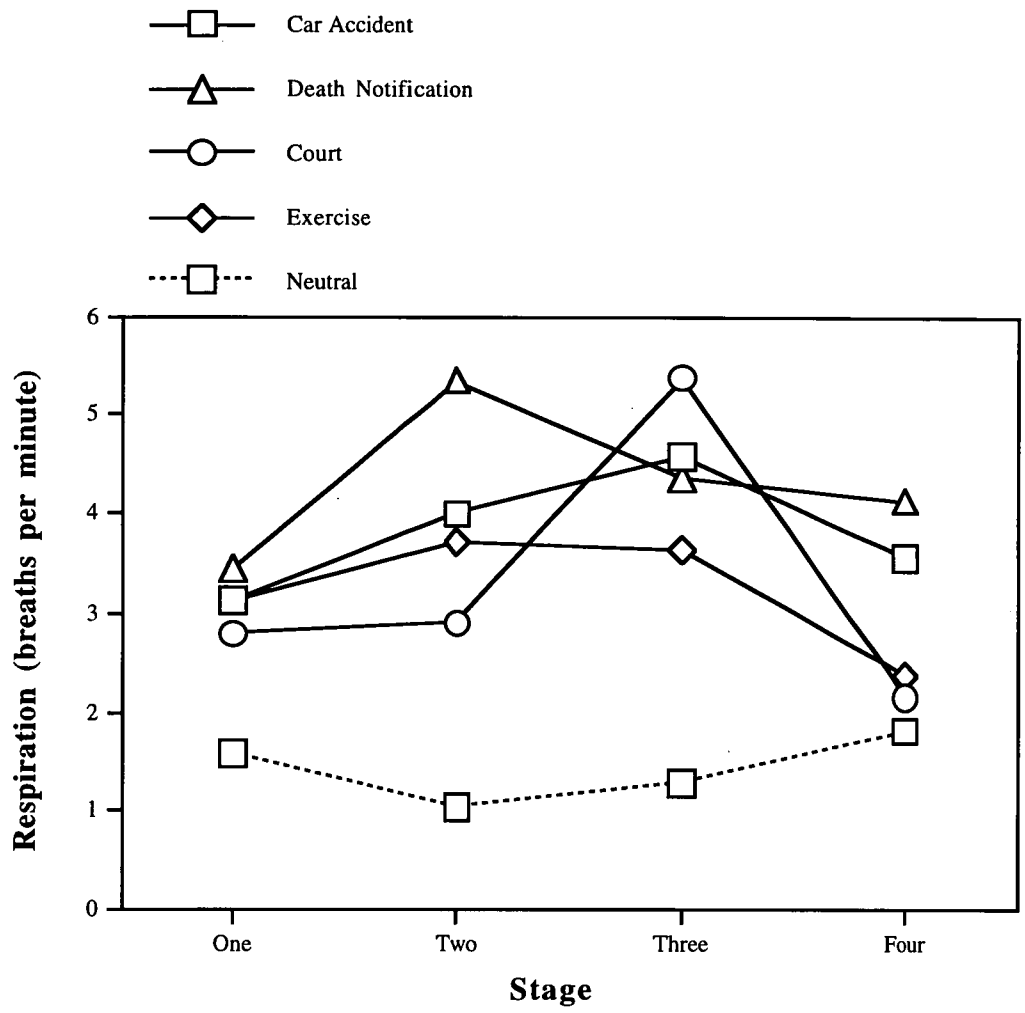

Figure 1. The pattern of psychophysiological arousal for Respiration change scores across the four stages of the five scripts.

arousing than the court script, $F(1, 228) = 8.25$, $p < .03$, the exercise script, $F(1, 228) = 6.54$, $p < .04$, and the neutral script, $F(1, 228) = 11.39$, $p < .01$. Stage 4 of the accident script was more arousing than Stage 4 of the neutral script, $F(1, 228) = 6.23$, $p < .04$.

Different patterns of arousal were evident across the four stages of the three work scripts for RESP. For the death notification script, arousal increased significantly from Stage 1 to Stage 2, $F(1, 228) = 7.54$, $p < .03$. RESP tended to increase more gradually during the car accident script, and there was a trend for increased arousal in Stage 3 compared to Stage 1, $F(1, 228) = 4.48$, $p = .062$.

RESP rose sharply in Stage 3 of the court script, and arousal was higher in Stage 3 than Stage 1, $F(1, 228) = 13.92$, $p < .005$, Stage 2, $F(1, 228) = 12.96$, $p < .007$, and Stage 4, $F(1, 228) = 21.55$, $p < .001$. The two control scripts did not differ significantly across stages.

Main effects for script were evident for RESP, $F(4, 76) = 5.09$, $p < .003$, HR, $F(4, 76) = 7.60$, $p < .001$, EMG, $F(4, 76) = 6.65$, $p < .001$, and FPA, $F(4, 76) = 10.83$, $p < .001$. For RESP, change scores were lower for the neutral script compared to the car accident, $F(1, 76) = 12.04$, $p < .002$, death notification, $F(1, 76) = 17.86$, $p < .001$, court, $F(1, 76) = 7.40$, $p < .02$, and exercise scripts, $F(1, 76) = 6.73$, $p < .02$.

HR data indicated higher arousal for the car accident script, $F(1, 76) = 17.33$, $p < .001$, the death notification script, $F(1, 76) = 18.65$, $p < .001$, the court script, $F(1, 76) = 21.36$, $p < .001$, and the exercise script, $F(1, 76) = 5.24$, $p < .03$, than for the neutral script. The death notification script, $F(1, 76) = 4.12$, $p < .05$, and the court script, $F(1, 76) = 5.44$, $p < .03$, were more arousing than the exercise script.

EMG showed elevated arousal for the death notification script compared to the car accident script, $F(1, 76) = 7.67$, $p < .02$, the exercise script, $F(1, 76) = 16.23$, $p < .001$, and the neutral script, $F(1, 76) = 21.64$, $p < .001$. There was a trend for the death notification script to be more arousing than the court script, $F(1, 76) = 4.18$, $p = .06$. The court script was more arousing than the neutral script, $F(1, 76) = 6.80$, $p < .02$.

FPA demonstrated higher arousal for the car accident script, $F(1, 76) = 10.49$, $p < .003$, the death notification script, $F(1, 76) = 7.67$, $p < .009$, and the court script, $F(1, 76) = 13.25$, $p < .001$, compared to the exercise script. Furthermore, each work script was more arousing than the neutral script, $F(1, 76) = 24.37$, $p < .001$ (car accident), $F(1, 76) = 19.96$, $p < .001$ (death notification), $F(1, 76) = 28.50$, $p < .001$ (court).

Main effects for stage of script were noted for SCL, $F(3, 57) = 38.81$, $p < .001$, EMG, $F(3, 57) = 8.88$, $p < .001$, and RESP, $F(3, 57) = 3.40$, $p < .05$. SCL evidenced significantly less change during Stage 1 compared to Stage 2, $F(1, 57) = 10.47$, $p < .020$, Stage 3, $F(1, 57) = 18.54$, $p < .002$, and Stage 4, $F(1, 57) = 33.25$, $p < .001$. There also was significantly less change during Stage 2 compared to Stage 4, $F(1, 57) = 6.45$, $p < .04$. For EMG, change scores were lower during Stage 1 compared to Stage 2, $F(1, 57) = 7.73$, $p < .02$, Stage 3, $F(1, 57) = 17.93$, $p < .001$, and Stage 4, $F(1, 57) = 21.75$, $p < .001$. RESP change scores were higher during Stage 3 than Stage 1, $F(1, 57) = 7.11$, $p < .03$, and Stage 4, $F(1, 57) = 7.32$, $p < .03$.

To summarise the psychophysiological data, the police officers were more aroused during the three work scripts compared to the two control scripts. EMG indicated elevated arousal for death notifications compared to attending car accidents. RESP was the only response to show an interaction between the scripts and their stages. Different patterns of arousal were evident across the four stages of the work situations for RESP.

Comparison of Subjective Responses to Scripts

Results demonstrated significant differences between the scripts for all measures, and significant script by stage interactions for five of the six measures.

Relaxed/Tense

A script by stage interaction was demonstrated for the Relaxed/Tense VAS, $F(12, 228) = 10.02$, $p < .001$. The interaction is presented in Figure 2. During Stage 1, court was significantly higher than car accidents, $F(1, 228) = 14.03$, $p < .001$, death notifications, $F(1, 228) = 5.41$, $p < .04$, exercise, $F(1, 228) = 101.09$, $p < .001$, and neutral, $F(1, 228) = 165.23$, $p < .001$. The car accident script was higher than the exercise script, $F(1, 228) = 39.80$, $p < .001$, and the neutral script,

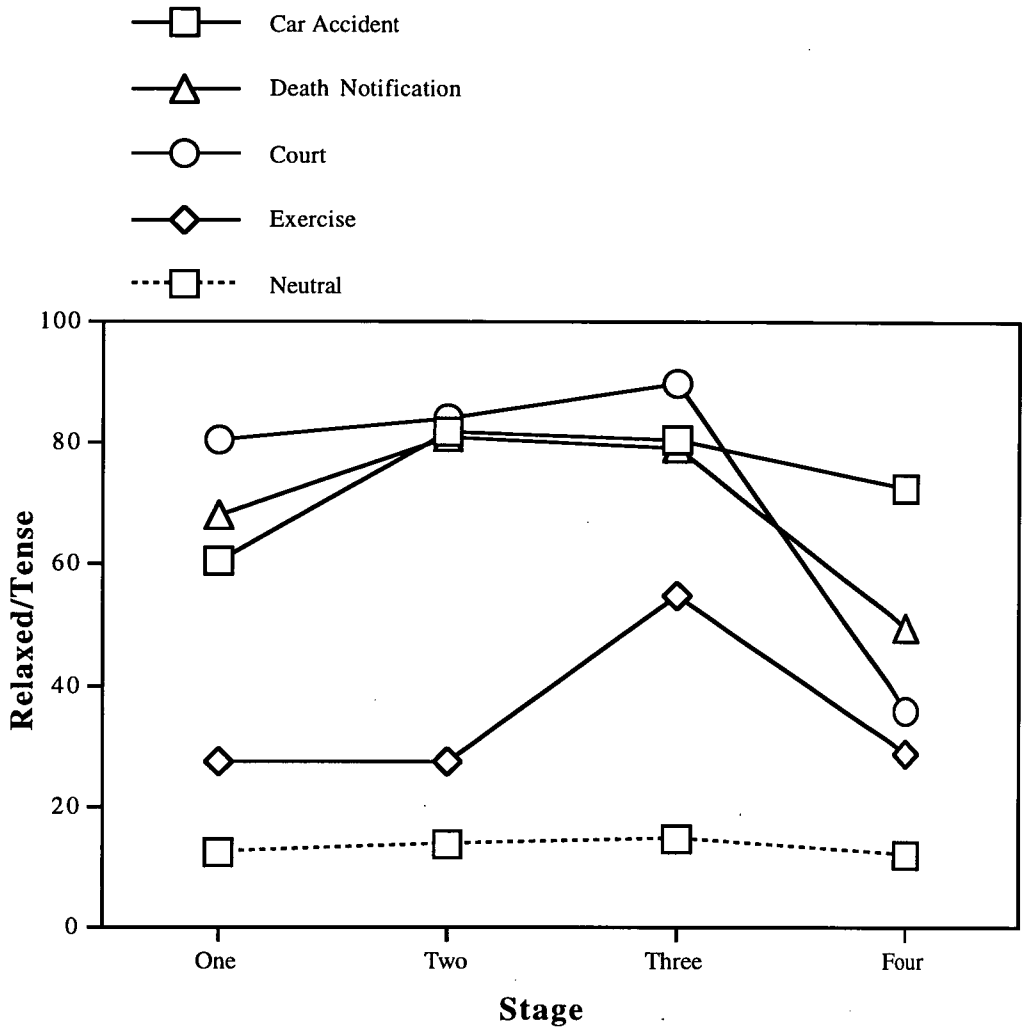

Figure 2. The pattern of subjective response for mean Relaxed/Tense scores across the four stages of the five scripts.

$F(1, 228) = 82.97$, $p < .001$. Stage 1 of death notifications also was higher than Stage 1 of the exercise, $F(1, 228) = 59.72$, $p < .001$, and neutral scripts, $F(1, 228) = 110.83$, $p < .001$. The exercise script was higher than the neutral script, $F(1, 228) = 7.84$, $p < .02$.

Analyses of Stage 2 data indicated that the car accident, $F(1, 228) = 105.52$, $p < .001$, death notification, $F(1, 228) = 102.05$, $p < .001$, and court scripts, $F(1, 228) = 113.63$, $p < .001$, were higher than the exercise script. The car accident, $F(1, 228) = 165.23$, $p < .001$, death notification, $F(1, 228) = 160.88$,

$p < .001$, court, $F(1, 228) = 175.35$, $p < .001$, and exercise scripts, $F(1, 228) = 6.67$, $p < .02$, were all higher than the neutral script.

Stage 3 responses demonstrated that the car accident, $F(1, 228) = 23.36$, $p < .001$, death notification, $F(1, 228) = 21.48$, $p < .001$, and court scripts, $F(1, 228) = 43.59$, $p < .0001$, were higher than the exercise script. The car accident, $F(1, 228) = 154.24$, $p < .001$, death notification, $F(1, 228) = 149.34$, $p < .001$, court, $F(1, 228) = 201.30$, $p < .001$, and exercise scripts, $F(1, 228) = 57.55$, $p < .001$, were all higher than the neutral script. There was a trend for court to be higher than death notifications, $F(1, 228) = 3.87$, $p = .06$.

During Stage 4, the subjective responses were higher for the car accident script than the death notification script, $F(1, 228) = 18.77$, $p < .001$, court script, $F(1, 228) = 47.81$, $p < .001$, exercise script, $F(1, 228) = 67.56$, $p < .001$, and neutral script, $F(1, 228) = 129.91$, $p < .001$. Death notifications were higher than the court, $F(1, 228) = 6.67$, $p < .02$, exercise, $F(1, 228) = 15.11$, $p < .001$, and neutral scripts, $F(1, 228) = 49.92$, $p < .001$. Court, $F(1, 228) = 20.10$, $p < .001$, and exercise, $F(1, 228) = 10.10$, $p < .005$, were higher than the neutral script.

Differences were detected across the four stages for the three work scripts and the exercise script. For car accidents, subjective responses were lower in Stage 1 compared to Stage 2, $F(1, 228) = 15.78$, $p < .001$, Stage 3, $F(1, 228) = 13.61$, $p < .002$, and Stage 4, $F(1, 228) = 4.77$, $p < .05$. For death notifications, Stage 1 was lower than Stage 2, $F(1, 228) = 5.68$, $p < .03$, and Stage 4, $F(1, 228) = 12.72$, $p < .002$. There was a trend for Stage 1 to be lower than Stage 3, $F(1, 228) = 4.29$, $p = .05$. Stage 2, $F(1, 228) = 35.40$, $p < .001$, and Stage 3, $F(1, 228) = 31.78$, $p < .001$, were higher than Stage 4. For court, a significant increase was demonstrated from Stage 2 to Stage 3, $F(1, 228) = 26.57$, $p < .001$, and then a significant decrease from Stage 3 to Stage 4, $F(1, 228) = 103.77$, $p < .001$. Stage 1, $F(1, 228) = 71.82$, $p < .001$, and Stage 2, $F(1, 228) = 82.62$, $p < .001$, were lower than Stage 4. During the exercise script, subjective response

was higher during Stage 3 than Stage 1, $F(1, 228) = 26.67$, $p < .001$, Stage 2, $F(1, 228) = 26.57$, $p < .001$, and Stage 4, $F(1, 228) = 23.91$, $p < .001$. No differences were demonstrated across the stages of the neutral script.

Results indicated a main effect for script, $F(4, 76) = 63.77$, $p < .001$. Ratings were higher for the car accident script, $F(1, 76) = 65.31$, $p < .001$, death notification script, $F(1, 76) = 51.64$, $p < .001$, and court script, $F(1, 76) = 60.92$, $p < .001$, compared to the exercise script. Ratings also were higher for the car accident script, $F(1, 76) = 155.86$, $p < .001$, death notification script, $F(1, 76) = 134.31$, $p < .001$, and court script, $F(1, 76) = 149.04$, $p < .001$, compared to the neutral script. Ratings were higher for the exercise script compared to the neutral script, $F(1, 76) = 19.39$, $p < .001$.

Results demonstrated a main effect for stage, $F(3, 57) = 33.64$, $p < .001$. Stage 1 was lower than Stage 2, $F(1, 57) = 9.12$, $p < .01$, and Stage 3, $F(1, 57) = 29.74$, $p < .001$. Stage 2 was lower than Stage 3, $F(1, 57) = 5.92$, $p < .03$. Stage 4 was lower than Stage 1, $F(1, 57) = 16.47$, $p < .001$, Stage 2, $F(1, 57) = 50.11$, $p < .001$, and Stage 3, $F(1, 57) = 90.49$, $p < .001$.

Calm/Angry

A stage by script interaction was evident for Calm/Angry, $F(12, 228) = 3.39$, $p < .002$. The interaction is presented in Figure 3. During Stage 1, the car accident, $F(1, 228) = 33.55$, $p < .001$, court, $F(1, 228) = 47.97$, $p < .001$, and death notification scripts, $F(1, 228) = 44.65$, $p < .001$, were significantly higher than the exercise script. The accident script, $F(1, 228) = 51.29$, $p < .001$, court script, $F(1, 228) = 68.82$, $p < .001$, and death notification script, $F(1, 228) = 64.83$, $p < .001$, were all higher than the neutral script.

For Stage 2, car accidents, $F(1, 228) = 59.87$, $p < .001$, death notifications, $F(1, 228) = 56.02$, $p < .001$, and court, $F(1, 228) = 47.37$, $p < .001$, were all higher than the exercise script. Car accidents, $F(1, 228) = 98.37$, $p < .001$, death

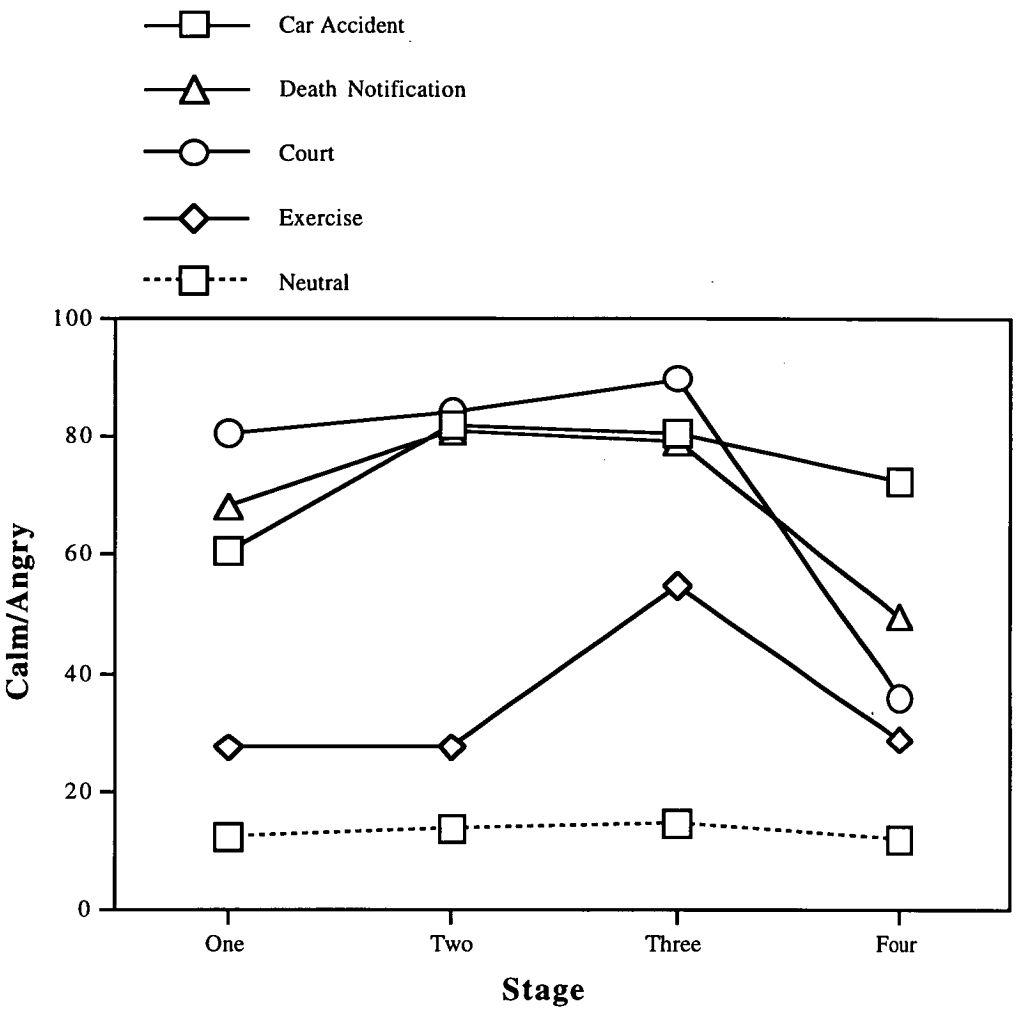

Figure 3. The pattern of subjective response for mean Calm/Angry scores across the four stages of the five scripts.

notifications, $F(1, 228) = 93.42$, $p < .001$, court, $F(1, 228) = 82.14$, $p < .001$, and exercise, $F(1, 228) = 4.76$, $p < .05$, were higher than the neutral script.

Ratings for Stage 3 indicated that court was significantly higher than car accidents, $F(1, 228) = 8.04$, $p < .02$, death notifications, $F(1, 228) = 10.19$, $p < .005$, exercise, $F(1, 228) = 41.56$, $p < .001$, and neutral, $F(1, 228) = 49.31$, $p < .001$. Car accidents, $F(1, 228) = 13.04$, $p < .002$, and death notifications, $F(1, 228) = 10.59$, $p < .005$, were higher than exercise. Car accidents, $F(1, 228) = 84.21$, $p < .001$, death notifications, $F(1, 228) = 77.78$, $p < .001$, and exercise, $F(1, 228) = 30.97$, $p < .001$, were higher than the neutral script.

During Stage 4, car accidents were higher than death notifications, $F(1, 228) = 15.20$, $p < .001$, court, $F(1, 228) = 5.59$, $p < .04$, exercise, $F(1, 228) = 62.18$, $p < .001$, and neutral scripts, $F(1, 228) = 88.10$, $p < .001$. Death notifications, $F(1, 228) = 15.89$, $p < .001$, and court, $F(1, 228) = 30.49$, $p < .001$, were significantly higher than exercise. The death notification, $F(1, 228) = 30.11$, $p < .001$, and court scripts, $F(1, 228) = 49.31$, $p < .001$, also were higher than the neutral script.

Analyses of the responses to the car accident script indicated lower subjective responses for Stage 1 compared to Stage 2, $F(1, 228) = 5.88$, $p < .03$, Stage 3, $F(1, 228) = 5.80$, $p < .03$, and Stage 4, $F(1, 228) = 3.75$, $p = .068$. For death notifications, Stage 4 was significantly lower than Stage 1, $F(1, 228) = 8.14$, $p < .02$, Stage 2, $F(1, 228) = 17.10$, $p < .001$, and Stage 3, $F(1, 228) = 16.10$, $p < .001$. A significant decrease was noted from Stage 3 to Stage 4, $F(1, 228) = 16.10$, $p < .001$. For court situations, ratings of anger were higher in Stage 3 compared to Stage 1, $F(1, 228) = 16.88$, $p < .001$, and Stage 2, $F(1, 228) = 13.49$, $p < .002$. Stage 4 was lower than Stage 3, $F(1, 228) = 32.15$, $p < .001$, and Stage 2, $F(1, 228) = 3.99$, $p = .06$. Subjective responses for exercise were higher during Stage 3 compared to Stage 1, $F(1, 228) = 21.05$, $p < .001$, Stage 2, $F(1, 228) = 16.88$, $p < .001$, and Stage 4, $F(1, 228) = 22.53$, $p < .001$. No changes across stages were noted for the neutral script.

Results demonstrated a main effect for script, $F(4, 76) = 63.24$, $p < .001$. Ratings were higher for car accidents, $F(1, 76) = 71.82$, $p < .001$, death notifications, $F(1, 76) = 52.55$, $p < .001$, and court, $F(1, 76) = 76.19$, $p < .001$, compared to exercise. Ratings were higher for car accidents, $F(1, 76) = 145.67$, $p < .001$, death notifications, $F(1, 76) = 117.59$, $p < .001$, and court, $F(1, 76) = 151.87$, $p < .001$, compared to neutral. Ratings for the exercise script were higher than ratings for the neutral script, $F(1, 76) = 12.92$, $p < .001$.

Results indicated a main effect for stage, $F(3, 57) = 14.23$, $p < .001$. Stage 3 was rated higher than Stage 1, $F(1, 57) = 25.13$, $p < .001$, Stage 2, $F(1, 57) = 10.98$, $p < .001$, and Stage 4, $F(1, 57) = 38.07$, $p < .001$. Stage 4 was rated lower than Stage 2, $F(1, 57) = 8.16$, $p < .02$.

Happy/Sad

Analyses of the ratings on the Happy/Sad VAS demonstrated a script by stage interaction, $F(12, 228) = 5.00$, $p < .001$. The interaction is presented in Figure 4. For Stage 1, the car accident, $F(1, 228) = 64.94$, $p < .001$, death notification, $F(1, 228) = 99.86$, $p < .001$, and court scripts, $F(1, 228) = 62.99$, $p < .001$, were higher than the exercise script. Car accidents, $F(1, 228) = 68.00$, $p < .001$, death notifications, $F(1, 228) = 103.65$, $p < .001$, and court, $F(1, 228) = 66.01$, $p < .001$, also were higher than the neutral script. There was a trend for death notifications to be higher than court, $F(1, 228) = 4.23$, $p = .06$.

For Stage 2, death notifications were higher than court, $F(1, 228) = 6.69$, $p < .03$, exercise, $F(1, 228) = 134.21$, $p < .001$, and neutral scripts, $F(1, 228) = 136.26$, $p < .001$. The car accident, $F(1, 228) = 110.75$, $p < .001$, and court scripts, $F(1, 228) = 80.97$, $p < .001$, also were higher than the exercise script. The court, $F(1, 228) = 82.57$, $p < .001$, and car accident scripts, $F(1, 228) = 112.62$, $p < .001$, were higher than the neutral script.

During Stage 3, death notifications were higher than court, $F(1, 228) = 12.13$, $p < .004$, exercise, $F(1, 228) = 120.01$, $p < .001$, and neutral scripts, $F(1, 228) = 189.72$, $p < .001$. There was a trend for death notifications to be higher than car accidents, $F(1, 228) = 4.55$, $p = .05$. Car accidents, $F(1, 228) = 77.81$, $p < .001$, and court, $F(1, 228) = 55.84$, $p < .001$, were higher than exercise. Car accidents, $F(1, 228) = 135.49$, $p < .001$, court, $F(1, 228) = 105.91$, $p < .001$, and exercise, $F(1, 228) = 7.95$, $p < .02$, were higher than the neutral script.

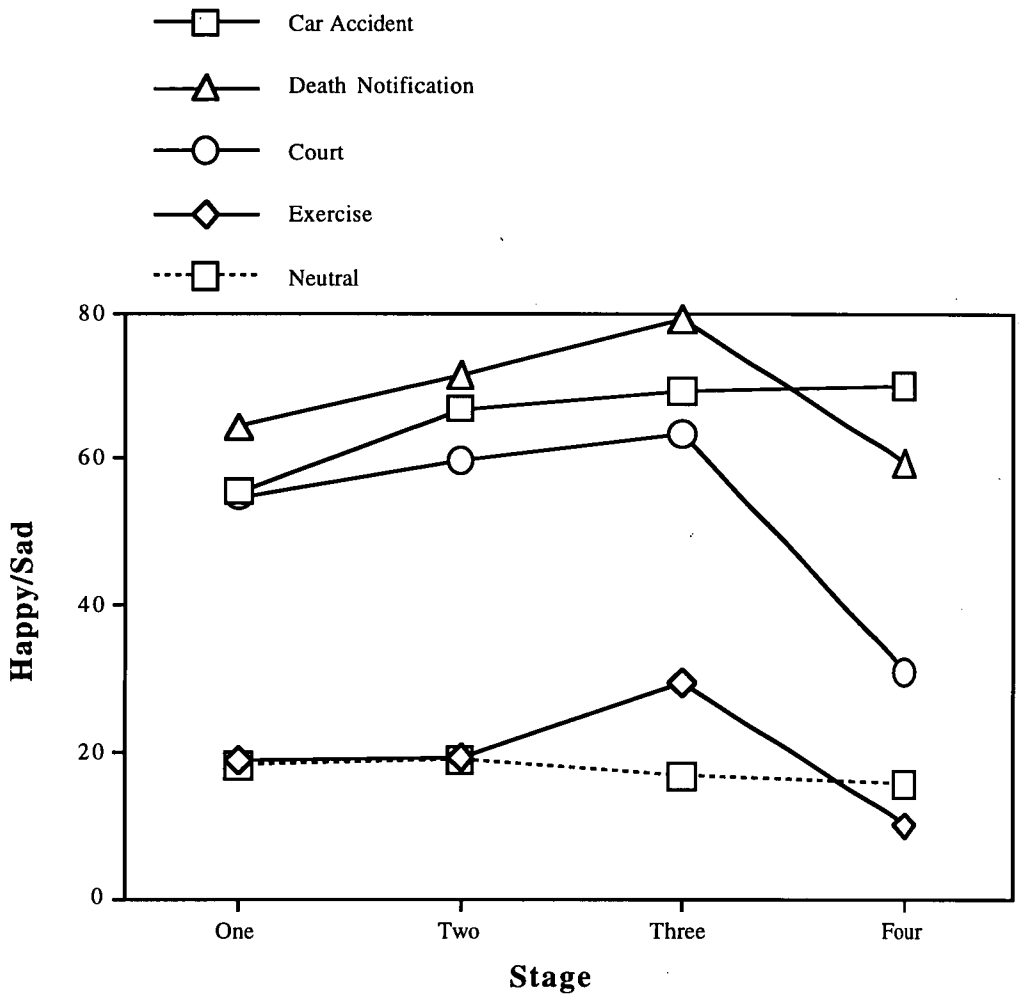

Figure 4. The pattern of subjective response for mean Happy/Sad scores across the four stages of the five scripts.

During Stage 4, it was evident that car accidents were higher than death notifications, $F(1, 228) = 5.29$, $p < .04$, court, $F(1, 228) = 73.77$, $p < .001$, exercise, $F(1, 228) = 175.08$, $p < .001$, and neutral scripts, $F(1, 228) = 143.32$, $p < .001$. Death notifications were higher than the court, $F(1, 228) = 39.56$, $p < .001$, exercise, $F(1, 228) = 119.52$, $p < .001$, and neutral scripts, $F(1, 228) = 93.56$, $p < .001$. Court was higher than the exercise script, $F(1, 228) = 21.56$, $p < .001$, and the neutral script, $F(1, 228) = 11.44$, $p < .005$.

Examination of the subjective responses across the stages of each script demonstrated that, for car accidents, responses to Stage 1 were significantly lower than responses to Stage 2, $F(1, 228) = 6.19$, $p < .03$, Stage 3, $F(1, 228) = 9.44$,

$p < .01$, and Stage 4, $F(1, 228) = 10.14$, $p < .008$. During the death notification script, subjective responses were higher during Stage 3 than Stage 1, $F(1, 228) = 10.71$, $p < .006$. Responses were lower during Stage 4 compared to Stage 2, $F(1, 228) = 7.19$, $p < .02$, and Stage 3, $F(1, 228) = 18.68$, $p < .001$. For the court script, Stage 4 was significantly lower than Stage 1, $F(1, 228) = 27.92$, $p < .001$, Stage 2, $F(1, 228) = 40.54$, $p < .001$, and Stage 3, $F(1, 228) = 50.84$, $p < .001$. For the exercise script, responses to Stage 3 were higher than responses to Stage 1, $F(1, 228) = 5.34$, $p < .04$, Stage 2, $F(1, 228) = 5.24$, $p < .05$, and Stage 4, $F(1, 228) = 18.49$, $p < .001$. No differences were demonstrated across the stages of the neutral script.

Results demonstrated a main effect for script, $F(4, 76) = 65.49$, $p < .001$. Ratings were higher for car accidents, $F(1, 76) = 9.21$, $p < .004$, and death notifications, $F(1, 76) = 14.25$, $p < .001$, compared to court. Car accidents, $F(1, 76) = 113.26$, $p < .001$, death notifications, $F(1, 76) = 129.59$, $p < .001$, and court, $F(1, 76) = 57.89$, $p < .001$, were higher than exercise. Ratings for car accidents, $F(1, 76) = 123.72$, $p < .001$, death notifications, $F(1, 76) = 140.76$, $p < .001$, and court, $F(1, 76) = 65.43$, $p < .001$, were higher than for neutral.

Results demonstrated a main effect for stage, $F(3, 57) = 20.09$, $p < .001$. Stage 1 was rated lower than Stage 2, $F(1, 57) = 8.71$, $p < .008$, and Stage 3, $F(1, 57) = 4.65$, $p < .05$. Stage 4 was lower than Stage 1, $F(1, 57) = 17.53$, $p < .001$, Stage 2, $F(1, 57) = 50.94$, $p < .001$, and Stage 3, $F(1, 57) = 40.22$, $p < .001$.

Unafraid/Afraid

An interaction was demonstrated between script and stage for the Unafraid/Afraid VAS, $F(12, 228) = 5.37$, $p < .001$. The interaction is presented in Figure 5. During Stage 1, court was rated higher than the car accident, $F(1, 228) =$

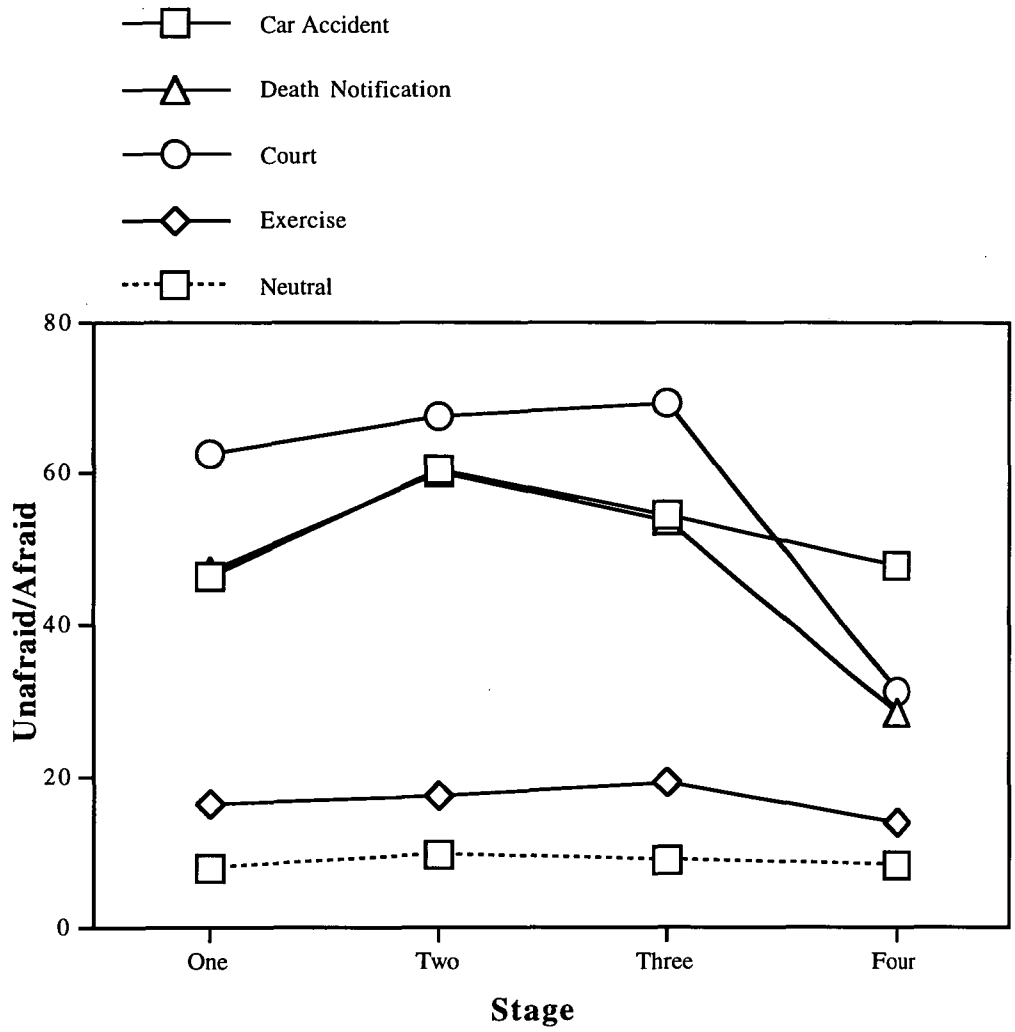

Figure 5. The pattern of subjective response for mean Unafraid/Afraid scores across the four stages of the five scripts.

10.64, $p < .008$, death notification, $F(1, 228) = 9.92$, $p < .01$, exercise, $F(1, 228) = 87.21$, $p < .001$, and neutral scripts, $F(1, 228) = 122.55$, $p < .001$. Car accidents, $F(1, 228) = 36.93$, $p < .001$, and death notifications, $F(1, 228) = 38.30$, $p < .001$, were higher than exercise. Car accidents, $F(1, 228) = 60.98$, $p < .001$, and death notifications, $F(1, 228) = 62.73$, $p < .001$, also were higher than the neutral script.

For Stage 2, car accidents, $F(1, 228) = 75.70$, $p < .001$, death notifications, $F(1, 228) = 74.29$, $p < .001$, and court, $F(1, 228) = 102.79$, $p < .001$, were higher than exercise. Car accidents, $F(1, 228) = 106.52$, $p < .001$, death

notifications, $F(1, 228) = 104.86$, $p < .001$, and court, $F(1, 228) = 138.28$, $p < .001$, also were higher than the neutral script.

Ratings during Stage 3 were higher for court than for the car accident, $F(1, 228) = 9.17$, $p < .02$, death notification, $F(1, 228) = 9.99$, $p < .01$, exercise, $F(1,228) = 102.38$, $p < .001$, and neutral scripts, $F(1, 228) = 148.96$, $p < .001$. Car accidents, $F(1, 228) = 50.27$, $p < .001$, and death notifications, $F(1, 228) = 48.42$, $p < .001$, were higher than the exercise script. Car accidents, $F(1, 228) = 84.21$, $p < .001$, and death notifications, $F(1, 228) = 81.81$, $p < .001$, were higher than the neutral script. There was a trend for exercise to be higher than the neutral script, $F(1, 228) = 4.35$, $p = .06$.

Stage 4 data indicated that car accidents were higher than the death notification, $F(1, 228) = 15.52$, $p < .002$, court, $F(1, 228) = 11.17$, $p < .007$, exercise, $F(1, 228) = 46.60$, $p < .001$, and neutral scripts, $F(1, 228) = 63.38$, $p < .001$. Death notifications, $F(1, 228) = 8.33$, $p < .02$, and court, $F(1, 228) = 12.14$, $p < .005$, were higher than exercise. Court, $F(1, 228) = 21.33$, $p < .001$, and death notifications, $F(1, 228) = 16.17$, $p < .002$, were higher than the neutral script.

Subjective responses to the car accident script were higher in Stage 2 than Stage 1, $F(1, 228) = 8.22$, $p < .02$, and Stage 4, $F(1, 228) = 6.72$, $p < .03$. For the death notification script, subjective responses were higher during Stage 2 than Stage 1, $F(1, 228) = 7.15$, $p < .03$, Stage 3, $F(1, 228) = 41.63$, $p < .001$, and Stage 4, $F(1, 228) = 41.63$, $p < .001$. Stage 4 was significantly lower than Stage 1, $F(1, 228) = 14.27$, $p < .003$, and Stage 3, $F(1, 228) = 26.58$, $p < .001$. For the court script, Stage 4 was lower than Stage 1, $F(1, 228) = 40.07$, $p < .001$, Stage 2, $F(1, 228) = 54.37$, $p < .001$, and Stage 3, $F(1, 228) = 59.57$, $p < .001$. No significant differences were demonstrated across stages for the exercise or neutral scripts.

Results demonstrated a main effect for script, $F(4, 76) = 57.28$, $p < .001$. Ratings for court were higher than the ratings for death notifications, $F(1, 76) = 6.29$, $p < .02$. Ratings for car accidents, $F(1, 76) = 72.94$, $p < .001$, death notifications, $F(1, 76) = 53.84$, $p < .001$, and court, $F(1, 76) = 96.94$, $p < .001$, were higher than ratings for exercise. Higher ratings were evident for car accidents, $F(1, 76) = 110.18$, $p < .001$, death notifications, $F(1, 76) = 86.38$, $p < .001$, and court, $F(1, 76) = 139.29$, $p < .001$, compared to neutral.

A main effect was demonstrated for stage, $F(3, 57) = 20.45$, $p < .001$. Stage 1 was rated lower than Stage 2, $F(1, 57) = 6.10$, $p < .04$, and Stage 3, $F(1, 57) = 22.29$, $p < .001$. Stage 2 was rated lower than Stage 3, $F(1, 57) = 5.06$, $p < .05$. Stage 4 was rated lower than Stage 1, $F(1, 57) = 6.94$, $p < .03$, Stage 2, $F(1, 57) = 26.06$, $p < .001$, and Stage 3, $F(1, 57) = 54.10$, $p < .001$.

Normal/Numb

An interaction between script and stage was evident for the Normal/Numb VAS, $F(12, 228) = 2.26$, $p < .03$. The interaction is presented in Figure 6. During Stage 1, the car accident, $F(1, 228) = 33.93$, $p < .001$, death notification, $F(1, 228) = 62.06$, $p < .001$, and court scripts, $F(1, 228) = 62.79$, $p < .001$, were rated higher than the exercise script. Car accidents, $F(1, 228) = 51.97$, $p < .001$, death notifications, $F(1, 228) = 85.79$, $p < .001$, and court, $F(1, 228) = 86.65$, $p < .001$, also were higher than the neutral script. There was a trend for the car accident script to be lower than the death notification script, $F(1, 228) = 4.22$, $p = .06$, and the court script, $F(1, 228) = 4.41$, $p = .05$.

For Stage 2, the car accident, $F(1, 228) = 88.81$, $p < .001$, death notification, $F(1, 228) = 95.67$, $p < .001$, and court scripts, $F(1, 228) = 92.32$, $p < .001$, were higher than the exercise script. The car accident, $F(1, 228) = 109.45$, $p < .001$, death notification, $F(1, 228) = 117.06$, $p < .001$, and court scripts, $F(1, 228) = 113.35$, $p < .001$, also were higher than the neutral script.

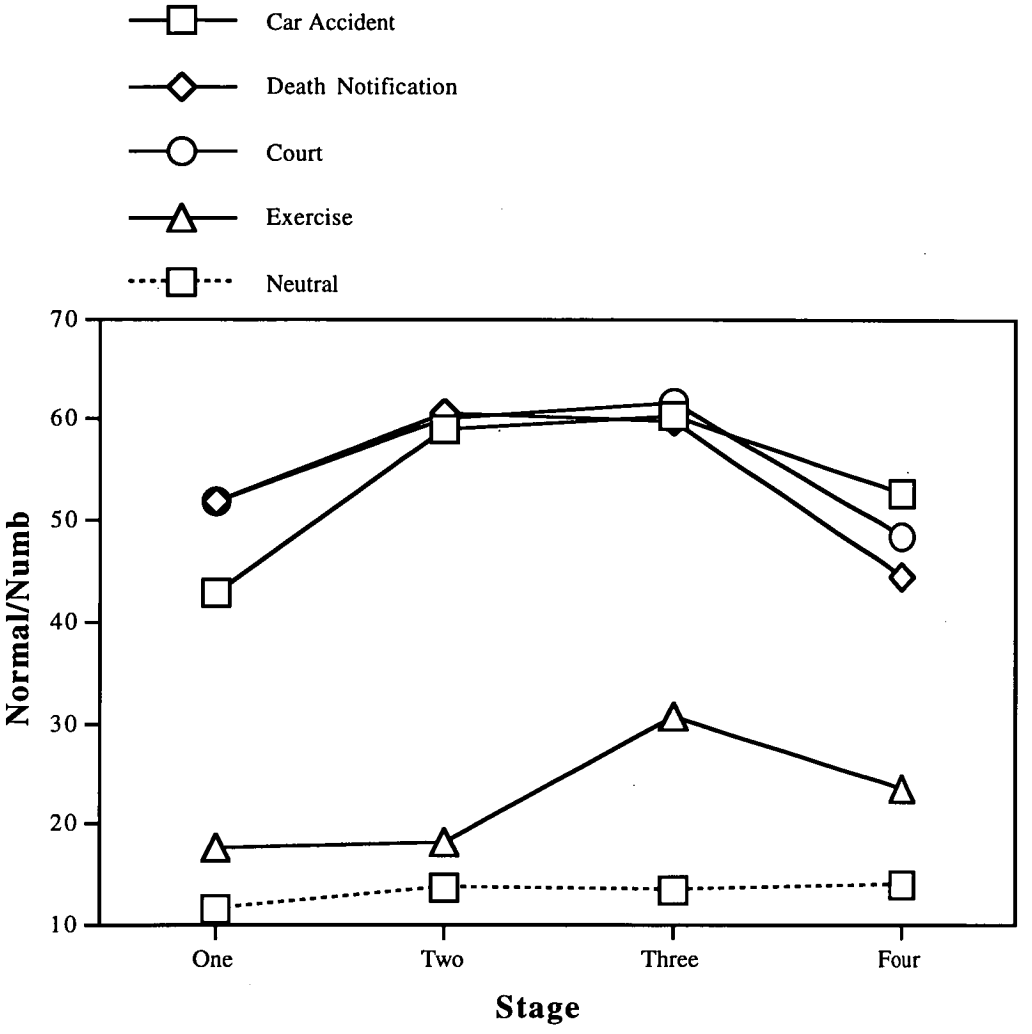

Figure 6. The pattern of subjective response for mean Normal/Numb scores across the four stages of the five scripts.

During Stage 3, the car accident, $F(1, 228) = 47.10$, $p < .001$, death notification, $F(1, 228) = 45.53$, $p < .001$, and court scripts, $F(1, 228) = 51.14$, $p < .001$, were higher than the exercise script. The car accident, $F(1, 228) = 116.31$, $p < .001$, death notification, $F(1, 228) = 113.84$, $p < .001$, court, $F(1, 228) = 122.61$, $p < .001$, and exercise scripts, $F(1, 228) = 15.38$, $p < .001$, were higher than the neutral script.

Ratings for Stage 4 were higher for the car accident, $F(1, 228) = 45.07$, $p < .001$, death notification, $F(1, 228) = 24.26$, $p < .001$, and court scripts, $F(1, 228) = 33.13$, $p < .001$, compared to the exercise script. The car accident,

$F(1, 228) = 79.70$, $p < .001$, death notification, $F(1, 228) = 50.98$, $p < .001$, court, $F(1, 228) = 63.53$, $p < .001$, and exercise scripts, $F(1, 228) = 4.91$, $p < .05$, were higher than the neutral script.

Subjective responses to the car accident script were lower during Stage 1 compared to Stage 2, $F(1, 228) = 14.05$, $p < .002$, Stage 3, $F(1, 228) = 16.21$, $p < .001$, and Stage 4, $F(1, 228) = 5.06$, $p < .04$. For the death notification script, responses were lower during Stage 4 of imagery compared to Stage 2, $F(1, 228) = 13.29$, $p < .002$, and Stage 3, $F(1, 228) = 11.89$, $p < .003$. Stage 3 of the court script was higher than Stage 1, $F(1, 228) = 4.91$, $p < .05$. Responses were lower for Stage 4 than Stage 2, $F(1, 228) = 6.98$, $p < .02$, and Stage 3, $F(1, 228) = 9.13$, $p < .008$. Responses were higher during Stage 3 of the exercise script than Stage 1, $F(1, 228) = 8.93$, $p < .009$, and Stage 2, $F(1, 228) = 8.05$, $p < .02$. No differences were evident across the stages of the neutral script.

A main effect was indicated for script, $F(4, 76) = 32.43$, $p < .001$. Car accidents, $F(1, 76) = 42.19$, $p < .001$, death notifications, $F(1, 76) = 47.03$, $p < .001$, and court, 47.45, $p < .001$, were rated higher than the exercise script. Car accidents, $F(1, 76) = 70.20$, $p < .001$, death notifications, $F(1, 76) = 76.41$, $p < .001$, and court, $F(1, 76) = 76.94$, $p < .001$, also were rated higher than the neutral script.

A main effect was shown for stage, $F(3, 57) = 11.68$, $p < .001$. Stage 1 was lower than Stage 2, $F(1, 57) = 8.29$, $p < .01$, and Stage 3, $F(1, 57) = 21.72$, $p < .001$. Stage 4 was lower than Stage 3, $F(1, 57) = 7.74$, $p < .02$.

Normal/Unreal

A main effect was demonstrated for script for the Normal/Unreal VAS, $F(4, 76) = 36.40$, $p < .001$. The car accident, $F(1, 76) = 42.19$, $p < .001$, death notification, $F(1, 76) = 47.03$, $p < .001$, and court scripts, $F(1, 76) = 47.45$, $p < .001$, were rated higher than the exercise script. The car accident, $F(1, 76) =$

70.20, $p < .001$, death notification, $F(1, 76) = 76.41$, $p < .001$, and court scripts, $F(1, 76) = 76.94$, $p < .001$, were rated higher than the neutral script. There was a trend for the exercise script to be rated higher than the neutral script, $F(1, 76) = 3.55$, $p = .06$.

A main effect for stage was evident, $F(3, 57) = 11.68$, $p < .001$. Subjective responses were lower in Stage 1 compared to Stage 2, $F(1, 57) = 8.29$, $p < .01$, and Stage 3, $F(1, 57) = 21.74$, $p < .001$. Stage 4 was lower than Stage 3, $F(1, 57) = 7.74$, $p < .02$.

Summary

To summarise the VAS results, the neutral script was rated most positively by the police officers, with no variations across stages evident. The exercise script was rated more positively than the three work scripts. Stage 3 of the exercise script tended to be rated more negatively than the other stages. The three work scripts were rated differently by the police officers, both in intensity and in the patterns of responding across stages. Court was rated most negatively on the scales of Calm/Angry and Relaxed/Tense. Death notifications were rated more highly on the Happy/Sad VAS. The car accident script was responded to more negatively in Stage 2 than in Stage 1, and ratings remained constant across Stages 3 and 4. A consistent pattern demonstrated subjective responses decreasing from Stage 3 to Stage 4 for the death notification and court scripts, with no such decrease being evident for the car accident script. The car accident script was rated significantly higher in Stage 4 than the other work scripts on Relaxed/Tense, Calm/Angry, Happy/Sad and Unafraid/Afraid.

8.3.4 Appraisal and psychophysiological and subjective responses

The psychophysiological and subjective responses of the police officers to the incident stage (Stage 3) of the three work scripts were correlated with primary appraisal, secondary appraisal, coping during and after the work situations, and the three outcome items, as reported in Study Two. Correlations for car accidents can be seen in Table 23, for death notifications in Table 24, and for court in Table 25.

Primary Appraisal

No relationships were evident between primary appraisals for car accidents or death notifications, and increased arousal. Increased arousal was demonstrated for FBV when court experiences were appraised as threatening.

Challenge appraisals were associated with increased ratings for the Relaxed/Tense VAS for car accidents, and with ratings of Unafraid/Afraid and Happy/Sad for court experiences. Threat appraisals were positively associated with ratings on Relaxed/Tense, Calm/Angry, Unafraid/Afraid, and Happy/Sad VASs for death notifications, and for Unafraid/Afraid and Happy/Sad VASs for court experiences.

Secondary Appraisal

When the police officers appraised car accidents as being able to be resolved, a negative relationship was demonstrated with RESP. Death notifications appraised as amenable to change were positively associated with HR and SCL, while needing to know more was positively correlated with EMG and SCL.

Ratings of acceptance of court experiences were positively correlated with ratings on the Unafraid/Afraid and Normal/Unreal VASs. Appraisals of resolution were negatively associated with ratings for Unafraid/Afraid (car accidents), Relaxed/Tense (death notifications) and Happy/Sad (court).

Table 23. Pearson correlation coefficients between appraisal, coping and outcome variables and the psychophysiological and subjective responses of police officers to car accidents.

Variable	FBV	FPA	HR	EMG	RESP	SCL	Tense	Angry	Afraid	Sad	Unreal	Numb
Primary Appraisal												
Threat	.11	-.23	-.01	-.05	.35	.13	.12	.31	.41	.28	.20	.26
Challenge	.11	-.06	.15	.33	.39	.40	.45*	.00	.18	.02	.15	.17
Secondary Appraisal												
Could change	.07	-.22	.24	-.05	.06	.33	.31	.44	.28	.26	.16	33
Had to accept	-.08	.11	-.15	.05	.04	-.28	.09	-.06	.27	.12	.06	.07
Needed to know more	-.23	-.10	-.08	.12	-.22	.06	.02	.09	.20	.17	.06	.03
Could resolve	.20	-.34	-.14	.01	-.55*	.00	-.29	-.13	-.47*	-.07	-.29	-.23
Coping at Scene of Accident												
Problem-focused	.05	.12	-.16	.31	.01	.18	.16	-.08	.27	.22	-.08	-.06
Flexible P.S.	-.20	.26	-.11	.30	.05	-10	.19	-.13	.29	.20	-.07	-.02
Planful P.S.	.17	.03	-.17	.29	-.01	.31	.13	-.05	.24	.20	-.09	-.08
Emotion-Focused	-.29	-.12	-.43	.18	-.22	-.23	-.22	-.38	-.33	-.13	-.41	-.42
Social Support	-.18	-.04	-.22	.21	-.02	.08	-.09	-.17	-.22	-.01	-.30	-.25
Positive Reappraisal	-.29	-.16	-.48*	.08	-.36	-.49*	-.29	-.46*	-.34	-.22	-.37	-.43
Dysfunctional	.47*	-.23	-.04	.00	.03	.45*	.24	.33	.33	.33	.25	.35
Self-Control	.23	.02	-.04	.20	.15	.38	.44	.22	.52*	.46*	.34	.34
Wishful Thinking	48*	-.13	-.05	-.19	-.01	.32	.03	.31	.20	.22	.17	.25
Anger-Control	.51*	-.42	.21	-.21	-.03	.51*	-.05	.29	-.01	-.08	-.04	.20

Table 23 continued

Coping After Accident												
Problem-Focused	.33	-.17	-.16	.02	-.05	.41	.07	.19	.22	.37	.07	.12
Active Coping	.45*	-.04	-.08	-.03	.15	.28	.01	.20	.17	.27	.08	.13
Planning	.30	-.34	.02	.09	-.07	.33	.19	.21	.13	.39	.02	.19
Instrumental S.S.	.33	-.01	-.44	-.14	-.13	.15	-.40	-.12	.04	.04	-.09	-.27
Restraint Coping	.15	-.26	-.09	-.09	-.15	.30	.13	.07	.24	.40	.18	.15
Suppression	-.06	-.33	.10	.33	.31	.34	.41	.36	.25	.44	.12	.25
Emotion-Focused	-.11	-.10	-.31	.17	.13	.00	-.14	-.01	.15	-.13	-.16	-.06
Positive Reinterpretation	-.03	-.16	-.32	.06	.03	-.02	.01	.10	.30	.25	.03	.08
Acceptance	.08	-.15	-.01	-.13	.21	.32	.11	.24	.50*	.13	.11	.31
Humour	-.45*	-.18	-.49*	.01	-.12	-.73***	-.37	-.32	-.38	-.34	-.37	-.35
Religion	.14	-.12	-.06	.04	-.19	.57**	-.01	.14	.08	.15	.15	.05
Emotional S.S.	.12	-.03	.05	-.02	.20	.53*	-.03	.29	.29	.04	.08	.15
Dysfunctional	.44	-.26	-.04	-.09	.00	.48*	.06	.26	.12	.32	.08	.19
Venting Emotions	.30	-.32	.10	-.05	.03	.59**	.13	.40	.27	.29	.17	.27
Denial	.15	.27	-.26	.27	.26	-.03	-.03	-.21	-.02	-.14	.01	-.12
Mental Disengagement	.48*	.12	-.13	-.18	-.13	.43	.06	-.05	-.03	.20	.24	.15
Behav. Disengagement	.30	-.04	-.11	-.29	-.10	-.05	-.22	-.33	-.01	.10	-.12	-.12
Alcohol/Drugs	.21	-.27	-.09	.08	.09	.10	.04	.26	-.01	.21	-.14	.05
Outcome												
Performance	-.19	-.18	-.33	.38	.14	.04	.07	-.14	-.27	-.08	-.19	-.17
Coping During	-.38	-.36	-.10	.10	.01	-.20	-.01	-.14	-.33	-.08	-.08	-.14
Coping After	-.56*	-.26	-.15	.01	.12	-.36	.06	-.02	-.03	.08	.09	-.04

Note: FBV = finger blood volume (in millivolts); FPA = finger pulse amplitude (in millivolts); HR = heart rate (in beats per minute); EMG = electromyography (in microvolts); RESP = respiration (in breaths per minute); SCL = skin conductance level (in micro mho); P.S. = problem-solving; S.S. = social support

*p<.05

**p<.01

***p<.001

Table 24. Pearson correlation coefficients between appraisal, coping and outcome variables and the psychophysiological and subjective responses of police officers to death notifications.

Variable	FBV	FPA	HR	EMG	RESP	SCL	Tense	Angry	Afraid	Sad	Unreal	Numb
Primary Appraisal												
Threat	.20	-.01	.23	.13	-.03	-.06	.47 *	.53*	.55*	.51*	.32	.32
Challenge	-.10	.31	-.33	-.20	.11	.27	-.21	-.16	-.28	-.26	-.18	-.12
Secondary Appraisal												
Could change	-.11	.20	.47*	.36	.27	.57**	.12	.32	.39	.13	.27	.30
Had to accept	.13	.18	.10	.20	.07	-.05	-.11	-.25	.23	-.07	-.17	-.18
Needed to know more	-.04	.40	.31	.56*	-.10	.55*	.21	.29	.07	.00	.20	.34
Could resolve	.10	.12	.33	-.38	-.05	-.03	-.45 *	-.44	-.38	-.33	-.33	-.30
Coping During Death Notification												
Problem-Focused	-.02	.31	-.18	.18	-.32	-.27	.11	.08	.28	-.04	.00	-.12
Flexible P.S.	.15	.21	-.14	.20	-.10	.09	.34	.23	.32	.19	.12	.17
Planful P.S.	-.15	.33	-.17	.13	-.43	.37	-.09	-.05	.19	-.21	-.09	.06
Emotion-Focused	.05	.14	-.24	.12	-.28	.23	-.25	-.19	.38	-.17	-.02	-.01
Social Support	-.04	.17	-.60**	-.21	-.15	.11	-.12	-.10	.10	-.09	-.07	-.09
Positive Reappraisal	.13	.03	.30	.44	-.27	.24	-.25	-.19	.49*	-.18	.06	.08
Dysfunctional	-.01	.34	.02	.33	-.04	.27	.55 *	.41	.61**	.34	.35	.29
Self-Control	-.06	.29	.01	.44	.01	.31	.44	.24	.50*	.14	.35	.31
Wishful Thinking	-.04	.29	.10	.34	-.28	.14	.47 *	.23	.35	.33	.01	.01
Anger-Control	.08	.20	-.30	-.05	.09	.12	.35	.47*	.51*	.38	.33	.24

Table 24 continued

Coping After Death Notification												
Problem-Focused	-.06	.20	-.06	-.16	.11	.27	-.04	.25	.31	.23	.30	.28
Active Coping	.39	.19	-.10	-.02	.44	.24	-.07	.10	.10	.08	.10	.08
Planning	-.25	-.07	-.19	-.25	-.07	-.08	-.02	.15	.44	.17	.15	.09
Instrumental S.S.	.01	.15	-.27	-.09	.17	.16	-.17	-.07	.06	-.14	-.01	-.01
Restraint Coping	-.05	.24	.08	.03	-.16	.20	.18	.29	.44	.30	.36	.37
Suppression	-.16	.10	-.06	-.08	.06	-.01	.26	.28	.52*	.30	.20	.16
Emotion-Focused	.33	.09	-.17	-.06	.10	-.02	.25	.18	.46*	.34	.20	.18
Positive Reinterpretation	.19	.09	-.10	-.04	-.30	.25	.42	.47*	.65**	.53*	.55*	.56*
Acceptance	.39	.19	-.10	.06	.05	.14	.30	.26	.31	.31	.37	.29
Humour	-.14	.30	-.18	-.21	.30	-.06	-.36	.01	.18	.11	.14	.02
Religion	-.05	-.17	-.08	.13	-.14	.30	-.02	.10	-.02	-.15	-.43	-.33
Emotional S.S.	.01	.20	-.15	.25	-.17	.37	.26	-.04	.19	.01	.08	.10
Dysfunctional	.00	-.32	.32	-.33	-.04	.15	-.02	.05	.20	.24	.18	.22
Venting Emotions	.09	-.35	.28	-.23	.01	.25	.04	.19	.11	.04	.04	.08
Denial	.02	-.15	.17	-.30	-.19	-.06	-.03	-.12	.11	.14	.12	.21
Mental Disengagement	-.15	-.27	.33	-.16	-.06	-.10	-.20	-.04	.14	.28	-.02	.14
Behav. Disengagement	.02	-.15	.18	-.35	-.14	.05	.01	-.05	.32	.42	.38	.38
Alcohol/Drugs	-.06	-.23	.37	-.29	-.11	.17	-.01	-.09	.11	.20	.20	.23
Outcome												
Performance	-.32	.21	-.28	-.26	.10	.01	.04	.07	-.22	-.16	-.10	-.10
Coping During	-.18	.13	-.26	.01	.23	-.22	.07	.07	-.31	-.31	-.08	-.11
Coping After	.05	.28	-.45*	.06	.12	-.32	.02	-.09	-.26	-.17	-.07	-.13

Note: FBV = finger blood volume (in millivolts); FPA = finger pulse amplitude (in millivolts); HR = heart rate (in beats per minute); EMG = electromyography (in microvolts); RESP = respiration (in breaths per minute); SCL = skin conductance level (in micro mho); P.S. = problem-solving; S.S. = social support

*p<.05

**p<.01

Table 25. Pearson correlation coefficients between appraisal, coping and outcome variables and the psychophysiological and subjective responses of police officers to court.

Variable	FBV	FPA	HR	EMG	RESP	SCL	Tense	Angry	Afraid	Sad	Unreal	Numb
Primary Appraisal												
Threat	.48*	.10	-.20	.11	-.11	-.07	.29	.05	.55*	.51*	.43	.41
Challenge	-.24	-.07	-.17	.04	.25	.17	-.20	-.16	-.56*	-.54*	-.33	-.41
Secondary Appraisal												
Could change	.22	-.08	-.12	.38	-.15	-.09	-.06	-.33	-.17	-.18	-.16	.00
Had to accept	.10	.18	-.16	-.12	.04	-.03	.14	-.13	.45*	.23	.54*	.44
Needed to know more	.36	-.06	-.01	.10	.15	-.14	.20	-.02	-.08	.15	.20	.05
Could resolve	-.05	-.31	-.18	-.04	.26	-.15	-.43	-.43	-.21	-.46*	-.17	-.36
Coping During Court												
Problem-Focused	-.10	-.17	.06	-.22	-.03	.11	.08	.05	.12	.24	.30	.28
Flexible P.S.	-.11	.23	-.06	-.22	-.08	.28	.18	.07	.07	.15	.27	.22
Planful P.S.	-.08	.11	.15	-.19	.02	-.04	-.01	.02	.15	.28	.28	.29
Emotion-Focused	.03	.00	.27	-.20	-.23	-.04	-.30	-.08	.04	.17	-.14	.00
Social Support	-.02	-.17	.26	-.31	-.04	-.06	-.20	-.07	.29	.37	.25	.17
Positive Reappraisal	.11	.06	-.04	-.10	-.27	-.05	-.12	-.11	.15	.32	.17	.27
Dysfunctional	-.11	.12	-.04	-.21	-.12	.05	-.15	.35	.28	.31	.09	.27
Self-Control	-.04	.25	-.38	-.30	-.01	-.17	-.03	.23	.07	.01	.02	.05
Wishful Thinking	-.08	.09	.18	-.01	-.24	-.01	.08	-.01	.26	.50*	.10	.33
Anger-Control	-.11	-.01	.08	-.14	-.02	.22	.23	.47*	.28	.19	.07	.18

Table 25 continued

Coping After Court												
Problem-Focused	.07	-.14	-.07	-.14	.18	.02	.12	.09	.24	.39	.33	.19
Active Coping	.10	-.04	-.29	.09	.18	-.16	.22	.30	.16	.21	.07	-.07
Planning	.11	-.21	-.01	-.10	.28	-.01	-.03	.14	.14	.26	.08	-.07
Instrumental S.S.	-.09	.06	-.16	.07	.27	.38	.05	-.24	.05	-.08	.24	.01
Restraint Coping	.23	-.22	.15	-.34	-.07	-.28	.07	.07	.24	.42	.40	.47*
Suppression	-.07	-.05	.13	-.28	-.16	.04	.09	.03	.24	.53*	.09	.37
Emotion-Focused	.08	.10	-.22	-.08	.08	-.03	-.12	.15	.35	.21	.10	.03
Positive Reinterpretation	.22	.04	-.48*	-.04	.13	-.18	.01	.34	.22	.17	-.01	-.13
Acceptance	.25	.10	-.12	-.01	.11	-.14	-.12	.23	.37	.26	.12	.04
Humour	-.03	.01	-.10	-.09	.06	-.30	-.31	-.32	.03	-.19	-.33	-.46*
Religion	-.04	-.21	.04	-.15	.01	-.17	.12	-.17	.27	.07	-.16	-.24
Emotional S.S.	.40	-.09	.01	-.02	.37	.04	.13	.19	.14	.14	.21	.19
Dysfunctional	.04	.28	.15	.03	.05	.37	.37	.60**	.48*	.50*	.46*	.45*
Venting Emotions	.16	.38	.44	.12	.03	.52*	.27	.42	.18	.38	.38	.41
Denial	-.11	.17	-.17	-.05	.20	-.02	.03	-.09	-.26	.06	.05	.07
Mental Disengagement	-.07	.17	-.12	-.05	-.09	.19	.34	.46*	.51*	.41	.44	.42
Behav. Disengagement	-.06	-.01	-.13	-.14	.03	-.15	.19	.40	.37	.28	.21	.09
Alcohol/Drugs	-.04	-.09	-.13	.03	.28	.01	.06	.25	.26	.12	-.05	-.03
Outcome												
Performance	.15	-.21	-.44	-.18	.23	-.18	-.16	-.03	-.39	-.09	.00	.00
Coping During	.20	-.09	.48*	-.34	.23	-.27	-.15	-.08	-.54*	-.04	.00	-.04
Coping After	.01	-.26	-.45*	-.38	.01	-.26	-.22	-.02	.49*	-.04	-.10	-.10

Note: FBV = finger blood volume (in millivolts); FPA = finger pulse amplitude (in millivolts); HR = heart rate (in beats per minute); EMG = electromyography (in microvolts); RESP = respiration (in breaths per minute); SCL = skin conductance level (in micro mho); P.S. = problem-solving; S.S. = social support

*p<.05

**p<.01

8.3.5 Coping and psychophysiological and subjective responses

Coping During Work Situations

During car accidents, HR and SCL were negatively associated with the use of the emotion-focused coping strategy of positive reappraisal. SCL was positively correlated with the general use of dysfunctional coping strategies. FBV and SCL were positively associated with the use of the dysfunctional coping strategy of anger-control. During death notifications, HR was negatively associated with the use of social support.

At the scene of car accidents, ratings of Calm/Angry were negatively associated with positive reappraisal. Ratings of Unafraid/Afraid and Happy/Sad were associated with the use of self-control. When delivering a death message, ratings of Relaxed/Tense were associated with the use of dysfunctional coping strategies and the specific strategy of wishful thinking. Ratings of Calm/Angry were related to the utilisation of anger-control. Ratings of Unafraid/Afraid were correlated with employing positive reappraisal, as well as dysfunctional strategies, including self-control and anger-control. During court, ratings of Happy/Sad were associated with using wishful thinking. Ratings of Calm/Angry were associated with utilising anger-control.

Coping After Work Situations

FBV was positively associated with the use of active coping and mental disengagement, and negatively associated with the use of humour after police officers had left the scene of car accidents. HR was negatively associated with using humour at this time. SCL was negatively associated with the use of humour, and positively associated with the use of religion and emotional social support, as well as dysfunctional strategies, including focusing on and venting emotions. No relationships between variables were demonstrated for death notifications. For

court, HR was negatively associated with employing positive reinterpretation and growth. SCL was positively associated with focusing on and venting emotions after the police officers had left court.

Self-reports on the Unafraid/Afraid VAS during car accidents were positively associated with the use of acceptance after the police officers had left the scene of car accidents. Ratings of Calm/Angry during death notifications were positively related to the use of positive reinterpretation and growth after the police officers had left the house where the death message had been delivered. Ratings of Unafraid/Afraid were positively associated with the use of suppression of competing activities, as well as emotion-focused strategies, including positive reinterpretation and growth and acceptance. Responses on the Happy/Sad, Normal/Numb and Normal/Unreal VASs positively correlated with utilising positive reinterpretation and growth. Reports of Calm/Angry during court were positively related to the use of dysfunctional strategies and mental disengagement after the police officers had left court. Ratings of Unafraid/Afraid were positively associated with employing dysfunctional strategies and mental disengagement. Self-reports on the Happy/Sad VAS were associated with using suppression and dysfunctional strategies. Ratings of Normal/Unreal also were positively correlated with the use of dysfunctional coping strategies. Ratings of Normal/Numb were positively associated with restraint coping and using dysfunctional coping strategies, and were negatively related to the use of humour.

8.3.6 Satisfaction with performance and coping and psychophysiological and subjective responses

Psychophysiological variables were not associated with ratings of performance during any of the work situations. They also were not associated with ratings of coping during car accidents or death notifications. However, HR was positively correlated with ratings of coping during court. FBV was negatively

associated with ratings of coping after the police officers had finished at the scene of car accidents. HR was negatively associated with ratings of coping after all three work situations had ended.

Ratings of satisfaction with performance during the three work situations were not related to any of subjective responses. Ratings of the VASs during car accidents and death notifications were not associated with ratings of satisfaction with coping during or after these situations. Ratings of Unafraid/Afraid during court were negatively associated with ratings of satisfaction with coping during court and ratings of satisfaction with coping after court.

DISCUSSION

The aims of this study were two-fold: to examine the psychophysiological and subjective responses of police officers to three work events, namely attending serious car accidents, delivering death notifications, and being cross-examined in court; and to investigate the psychophysiological and subjective correlates of aspects of the transactional model of stress, namely cognitive appraisal, coping and satisfaction with outcome. Responses of police officers to the work events were compared to two control situations, and a control group was used to compare officers' responses.

It was hypothesised that the police would respond both psychophysiologically and subjectively in ways similar to the control group to the stressful situation and the two control events. No differences were demonstrated for the groups for either the high arousal (exercise) or low arousal (neutral) control situations. While some psychophysiological differences were demonstrated for the stressful situation, only RESP differentiated the groups on reactivity to the scripts. RESP indicated changes in arousal for the court script, but constant arousal for the interview script. For the police, RESP was highest in Stage 3, while it was

constant for the controls following an initial increase in Stage 2. Thus, different arousal patterns were evident for the court script and the interview script. These group differences may be explained by the situations depicted in the scripts being different. The subjective responses appeared to support this explanation. Group differences on the VASs demonstrated the police officers rating court, and especially Stage 3, more negatively than the controls' ratings of their stressful interview. Importantly, the police and control groups reported similar subjective responses for the control scripts. Thus, the police responded psychophysiologically and subjectively to the control scripts in a manner similar to the control group. The differences detected between the two groups for the stressful script may be explained by the two situations used being different. The difficulties in obtaining similar situations to be used in this type of research may be impossible to overcome. This problem is confounded by the fact that previous research has indicated that there was little value in subjecting people to situations that they had previously not experienced (Haines et al., 1995).

For the police officers, it was expected that the three work scripts would be more arousing than the two control situations. The psychophysiological responses of FPA, HR and EMG differentiated the work situations from the exercise and neutral situations. Additionally, HR differentiated the exercise script from the neutral script. These psychophysiological responses were elevated during Stage 1 of the work scripts compared to the control scripts, and remained high throughout the work situations. The three work situations were not differentiated from one another on FPA or HR. EMG, however, indicated increased muscle tension during death notifications than at the scenes of car accidents, and there was a trend for there to be more muscle tension for death notifications compared to court. It is to be noted that differential patterns of psychophysiological responding to different stimuli is not uncommon (e.g., Carrere, Evans, Palsane & Rivas, 1991; Gomez & McLaren, in press; McLaren et al., 1996; Smith, 1989; Vivoli, Bergomi, Rovesti,

Carrozzi & Vezzosi, 1993; Wilson, Albright, Steiner & Andreassi, 1991). Such differential responding has been related to stimuls-response specificity of the autonomic nervous system (e.g., Collet, Deschaumes-Molinaro, Delhomme, Dittmar & Vernet-Maury, 1994; Deschaumes-Molinaro, Dittmar, Sicard & Vernet-Maury, 1991; Ekman, Levenson & Friesen, 1983; Lacey, Bateman & Vanlehn, 1953; Vernet-Maury, Sicard, Dittmar & Deschaumes-Molinaro, 1990; Wilson et al., 1991).

RESP indicated different patterns of arousal for the work situations. For death notifications, RESP increased while going to an address to deliver a death notification (Stage 2). In court, the increase occurred during cross-examination (Stage 3) and then decreased when leaving the court room (Stage 4). RESP was significantly lower for Stage 4 of court compared to car accidents and death notifications. Thus, the psychophysiological responses clearly indicated arousal associated with the work events, and there was some differentiation between the three work situations.

The subjective measures demonstrated many effects between scripts and across stages. Different emotions were associated with different work events. Car accidents were associated with tension, death notifications were accompanied by feelings of sadness, and court was accompanied by feelings of anger and tension. The four stages of each situation were experienced differently by the police officers. Driving to the scene of a car accident was experienced more negatively than being informed of the task, and subjective responses, therefore, were higher in Stage 2 than Stage 1. Subjective responses then remained at a constant level. The police officers indicated that thoughts flashed through their minds when driving to the accident scene. They thought about what they might see at the accident scene, and the extent of human suffering they might encounter once there. Further, they were preoccupied by police procedures. Upon arrival at the accident scene, the police officers varied in the main tasks they performed. Some attended

the victims and assisted ambulance personnel, whereas others undertook direction of traffic. However, all police officers had some contact with the victims.

For death notifications, subjective responses increased when the police officers were en route to the address where the death message was to be delivered (Stage 2). Responses remained high when delivering the message (Stage 3), before decreasing significantly when leaving the house (Stage 4). During Stage 2, the police officers invariably searched their minds for the right words to use. It was evident during the interviews that compiling the death message was very stressful, and this was demonstrated in the subjective responses and the RESP responses during imagery. The police officers reported great relief upon leaving the house where the message was delivered. Whereas most police officers thought about the relatives briefly, these thoughts did not persist when driving away. This practice was seen by the officers as a coping mechanism. In relation to death notifications, most of the police officers indicated a wish not to perform this task again.

During court, subjective responses were high while waiting to go into court (Stage 1) and increased further during cross-examination (Stage 3), before decreasing significantly upon leaving the court room (Stage 4). During Stage 1, the police officers invariably were rehearsing their evidence, and concentrating on not forgetting anything. The desire to appear professional and competent was evident. Cross-examination was very stressful for the police officers, with lawyer confrontation being the main cause of this stress. Similar results concerning the stress of court have been demonstrated previously (Kroes, 1976; McLaren, 1990). Upon leaving the court room, the police officers reported great relief, and this was evident in the RESP and subjective responses. Most police officers thought little about the case and their performance once they had left court.

It is important to note that subjective responses for death notifications and court experiences decreased significantly upon leaving the house or court room,

respectively, but remained high when police officers left the scene of a serious car accident. Whereas there was a significant reduction in feelings of fear, anger, tension and sadness for court and death notifications, the police officers left the scenes of car accidents with elevated levels of these feelings. This finding has clear implications for the police organisation and appears to reinforce the need for CISD procedures after attending serious car accidents.

The current research has established that work situations were physiologically arousing and resulted in emotional responses by police officers. It has demonstrated the usefulness of personalised guided imagery in investigating behaviours that are difficult to study, as has been the case in investigating clinical behaviours (Brain et al., 1996; Driscoll et al., 1996; Haines et al., 1995; Williams et al., 1995). Not only were the work situations shown to be psychophysiologically and subjectively differentially experienced by the police from the control situations, HR also differentiated the exercise script from the neutral script. The four stage methodology of guided imagery (Haines et al., 1995; Williams et al., 1989; Williams et al., 1995) allowed each situation to be divided into distinct parts. Results, particularly the subjective responses, indicated that each work situation consisted of distinct parts, thereby supporting the claim in Study Two that such work situations were dynamic, unfolding experiences. The stress and arousal associated with each stage of the encounter were not the same across the situations. The stress associated with Stage 2 of death notifications indicated anticipatory anxiety, whereas the stress associated with Stage 3 of court indicated situational anxiety. The police officers' responses during Stages 3 and 4 of car accidents indicated situational anxiety and consequential anxiety, respectively. These differential responses for each situation have implications for intervention, including stress management techniques and CISD procedures, in terms of assisting police officers in coping with the demands of their occupation. The results of this study indicated that the type of intervention strategy implemented

should depend on the work situation being targeted, as well as the timing of the intervention.

It has been contended that this methodology offered a way of measuring a range of behaviours that were otherwise difficult to monitor (Haines et al., 1995). The results of this study indicated that the methodology, although exceedingly labour-intensive, was a useful diagnostic tool for examining the effects of stressful occupational demands. Future research may profitably employ the methodology to examine the efficacy of various intervention strategies. For example, research could investigate the ability of police officers to learn to reduce their anticipatory and situational anxiety responses to specific situations. Further, the efficacy of CISD procedures in reducing stress responses to particular situations may be investigated using this methodology.

The second aim of this study was to investigate the psychophysiological and subjective correlates of cognitive appraisal, coping and satisfaction with the outcome of an encounter. It was predicted that challenge appraisals would be associated with increased HR (Tomaka et al., 1993), and that threat appraisals would be associated with increased SCL (Lazarus & Alfert, 1964; Speisman et al., 1964) and increased self-reported stress (Tomaka et al., 1993). Hypotheses could not be drawn from previous research on the correlates of specific coping strategies, with the exception of social support, which was predicted to be negatively related to HR.

The results did not support the predictions between challenge appraisals and increased HR, nor between threat appraisals and increased SCL. However, threat appraisals of court were associated with increased FBV. The failure of the current study to support previous research may be explained as a function of the stressors under investigation. Previous research has used laboratory stressors, while the current research investigated the psychophysiological correlates of appraisals of real life situations. It may be that the appraisal processes in real life were more

complicated than those induced in laboratory situations. The difference in results between this study and previous research was further demonstrated by the subjective responses of the police officers. Challenge appraisals were significantly related to increased ratings of tension for car accidents and with ratings of fear and sadness for court. Threat appraisals were positively associated with ratings of tension, anger, fear and sadness for death notifications, and with ratings of fear and sadness for court. Thus, the self-report data did provide some support for the hypothesis that threat appraisals were associated with increased ratings of stress, but this was equally true for challenge appraisals.

Psychophysiological arousal was associated more with secondary appraisal of the work situations than with primary appraisal. Increased SCL and HR were related to appraisals of amenable to change. EMG and SCL were associated with needing to know more, and RESP was associated with resolvable appraisals. The police officers' subjective responses also were related to secondary appraisal. The appraisal of acceptance was positively related to fear and depersonalisation (Real/Unreal VAS), while resolution was negatively associated with feelings of fear, tension and sadness.

Since past research has tended not to examine the psychophysiological correlates of specific coping strategies, this aspect of the study had to be exploratory in nature. Results of coping during the work situations demonstrated that HR was negatively related to the use of social support, as predicted, and also to the utilisation of positive reappraisal. SCL also was negatively related to using positive reappraisal. SCL was positively associated with the general use of dysfunctional coping strategies, and both SCL and FBV were positively associated with employing anger-control. Most of the significant correlations between the coping strategies utilised and the self-report data, demonstrated positive correlations. The exception here was positive reappraisal, which was associated with reports of calmness as opposed to anger during car accidents.

Results of the relationships between psychophysiological responding during the work situations and coping strategies utilised after a situation, demonstrated several significant correlations. Lower arousal was related to the subsequent use of humour. Increased arousal was associated with the subsequent employment of active coping, mental disengagement, religion, emotional social support, focusing on and venting emotions, and dysfunctional coping strategies in general. More positive subjective responses during the encounters were associated with the use of humour. All other correlations were positive, indicating more negative subjective responses being associated with the use of emotion-focused coping strategies (death notifications) and dysfunctional coping strategies (court).

The psychophysiological responses of the police officers were not related to their ratings of performance during the work situations. The coping strategies utilised were more often related to ratings of performance, as demonstrated in Study Two. Increased arousal, reflected in higher HR, was associated with increased ratings of satisfaction with coping during court, while lower arousal, reflected in FBV and HR, was associated with increased ratings of coping after the work situations. Ratings of fear during court were associated with lower ratings of satisfaction with coping during and after court.

As previously indicated, the large number of correlations calculated may have inflated the Type 1 error rate. As was the case in Study Two, the exploratory nature of this aspect of the research required all of the variables to be included in the analyses. As was argued in the previous study, the correlations with an alpha level of .05 highlighted correlates between aspects present in the work encounters and the police officers' psychophysiological and subjective responses to the work situations. These correlations should not be ignored. Rather, they should be investigated in future research which employs larger samples and, consequently, more powerful statistical analyses.

The results of this study suggested a number of psychophysiological correlates of primary and secondary appraisal, coping during and after a work situation, and ratings of satisfaction with a work situation. It is important to note that the relationship often varied between situations, and therefore context was important. This reinforced the proposition of Lazarus and Folkman (1984) that in order to understand how an individual coped with a situation, researchers must know what was being coped with. The importance of investigating specific situations compared to general coping has therefore been emphasised. This emphasis appeared to be equally applicable to the other facets of the transactional model of stress.

The role of cognitive appraisal in the occupational stress process has been underinvestigated (Dewe, 1991b, 1992). This was significant given the important role it has been demonstrated to play in the interpretation of wide ranging encounters by individuals (Croyle, 1992; Dewe, 1991b, 1992; Fairbank et al., 1991; Folkman, Lazarus, Dunkel-Schetter, et al., 1986; Folkman, Lazarus, Gruen & DeLongis, 1986; Gadzella et al., 1991; Larsson et al., 1988; Lazarus & Folkman, 1984; Ptacek et al., 1992; Rochford & Blocker, 1991). It is an explanation for the differences in adaptation demonstrated during and following adverse experiences, including natural disasters (Rochford & Blocker, 1991) and being a prisoner of war (Fairbank et al., 1991). The interpretation of an encounter is central to understanding the differences in experiences reported by individuals (Lazarus & Folkman, 1984). Given that individuals who subjectively experienced stress have been demonstrated to be more susceptible to disease, including cardiovascular disease (Adler & Matthews, 1994) which has a physiological basis, it would appear important to continue to investigate the psychophysiological correlates of cognitive appraisal. The exploration of the psychophysiological correlates of the appraisal process may have important implications for the relationship between stress, including occupational stress, and the development of

psychopathology and symptomatology. It may be that the psychophysiological correlates of stress demonstrated in previous research (e.g., Bolm-Audorff et al., 1989; Goldstein et al., 1992; Houtman & Bakker, 1991a, 1991b; Payne & Rick, 1986) actually arose from the cognitive appraisal of particular encounters. The role of cognitive appraisal in relation to psychophysiological arousal has not been examined in such research. This may be seen as a limitation in previous research. Further research investigating the psychophysiological correlates of cognitive appraisal is clearly warranted. The need for such research is emphasised when one considers that psychophysiological arousal can be reduced when participants reappraise an encounter (Holmes & Houston, 1974).

It is evident that the psychophysiological correlates of the transactional model of stress should be further investigated. In particular, there is a need for this research to focus on real life situations. Research has indicated that psychophysiological responses to laboratory stressors did not necessarily predict responses to stressors in the field (Johnston, Anastasiades & Wood, 1990; Johnston et al., 1993; Matthews, Owens, Allen & Stoney, 1992). In order to investigate the psychophysiological correlates of responses to real life encounters, methodological limitations, such as those experienced when using ambulatory recordings, need to be addressed. Guided imagery may continue to be utilised for such research. Until such methodological issues are addressed, research of the nature reported here will remain in the minority, and the importance of psychophysiological responses to work situations will be underinvestigated.

CHAPTER NINE

CONCLUSIONS

9. CONCLUSIONS

9.1 Summary of results

It is evident that occupational stress in police officers has been heavily researched. Previous research has documented the antecedents and consequences of this stress. Examination of the literature indicated that previous research has focused heavily on self-report data, with little research incorporating psychophysiological measures. This is in contrast to research investigating occupational stress in other occupations (e.g., Davis & Rodela, 1990; Evans & Carrere, 1991; Fox & Dwyer, 1995; Korunka et al., 1996; Kozena et al., 1995; Shapiro et al., 1993; Siegrist, 1995; Sims, 1995; Travers & Cooper, 1994). Previous research also has been limited because researchers have often failed to use comparison groups in their investigations (e.g., Doctor et al., 1994; Loo, 1986; Stratton et al., 1984; Violanti & Aron, 1993). Consequently, the relative stressfulness of police work has not been consistently demonstrated (e.g., Gaines & Jermier, 1983; Hart et al., 1995; Lester & Gallagher, 1980; Lester & Mink, 1979; Marmar et al., 1996; Pendergrass & Ostrove, 1984).

The first study investigated the relative stressfulness of police work compared to clerical work, using self-report and cardiovascular measures. Results demonstrated that police work was not more stressful than clerical work. However, the nature of the stressors reported did differentiate the occupational groups. Further, it was shown that all work days were not the same, with stressful experiences being present on only some work days for some workers. Thus, the research indicated that work days differ in content, and workers' subjective and psychophysiological responses to such work days differ. These results highlighted the limitations of previous occupational stress research which has focused on short time frames (e.g., Frankenhaeuser et al., 1989; Goldstein et al., 1992; Lundberg et

al., 1989; Steptoe et al., 1996). In order to fully document the impact of work, researchers need to extend the period of investigation. This enables measurements for the same worker to be taken on days away from work, on days during which stressful situations occur, and on days during which no such situations are experienced.

The results of the first study, as reported here and elsewhere (McLaren, in press), highlighted the importance of specific situations in the subjective and psychophysiological responses of police officers. Three work situations were reported by participants as being particularly stressful: attending the scene of a serious car accident, delivering a death notification, and attending court as witness. These same situations were demonstrated to cause concern for participants in previous research using Tasmanian police officers (McLaren, 1990). Therefore, they were the subject of further investigation.

When examining the impact of particular situations on individuals, it is clear that cognitive appraisal and coping are important (Croyle, 1992; Dewe, 1991b, 1992; Folkman, Lazarus, Dunkel-Schetter, et al., 1986; Folkman, Lazarus, Gruen & DeLongis, 1986; Gadzella et al., 1991; Larsson et al., 1988; Ptacek et al., 1992). These two processes are critical mediators of the person-environment relationship (Folkman, Lazarus, Dunkel-Schetter, et al., 1986). They are responsible for the experience one has when encountering a stimulus in the environment. The second study investigated the ways in which police officers cognitively appraised and coped with the three work situations. Results demonstrated that the police officers interpreted all three situations as being challenging, to a lesser extent threatening, and as having to be accepted. Results also showed that police officers used a range of dysfunctional, problem- and emotion-focused coping strategies during each situation, but that they relied on emotion-focused coping strategies after each situation had ended. The results suggested that the police officers were aware of the emotions aroused by the work

they perform, and that they attempted to deal with these emotions both during and after each work situation.

In the third study, the police officers' psychophysiological and subjective responses to each work situation were investigated. To circumvent the methodological difficulties highlighted in the literature, as well as practical difficulties outlined, the police officers were exposed to previously experienced work situations through the use of guided imagery. Results demonstrated that the police officers responded to control and stressful situations in ways similar to individuals not engaged in police work. Further, results indicated that the three work situations were more arousing and subjectively experienced in a more negative way compared to two control situations. Generally, anticipatory stress was demonstrated for death notifications. Situational stress was evident for court appearances, and situational and consequential stress was demonstrated for car accidents. A range of procedural and practical considerations arise from these results. These will be considered in the next section.

The third study also investigated the psychophysiological and subjective correlates of cognitive appraisal and particular coping strategies. Given that previous research in this area had been limited to laboratory stressors (e.g., Bongard et al., 1994; Gerin et al., 1992; Smith, 1989; Tomaka et al., 1993), this aspect of the study was exploratory. Results demonstrated a number of correlations, few of which corresponded to the expected results based on previous research. Challenge and threat appraisals were not related to HR and SCL, respectively, and both types of cognitive appraisal were related to subjective stressful experiences. Psychophysiological and subjective responses were related to a number of secondary appraisals, as well as an array of coping strategies. Both positive and negative correlations were demonstrated, depending on the variables in question. The consistent use of social support and humour was related to lower psychophysiological arousal and more positive subjective experiences.

Overall, the research has demonstrated the importance of measuring psychophysiological and subjective responses to work in general, and to specific work situations. The vast majority of stress researchers who have relied exclusively on self-report measures, would appear to be missing aspects of the stress response (Bruning & Frew, 1987; Burke, 1987c; Fried et al., 1984), because stress is a whole body response (Fleming & Baum, 1987; Steptoe, 1991). To more fully clarify the process of stress, researchers should use both psychological and psychophysiological measures in their research (Balick & Herd, 1987; Burke, 1987c; Fleming & Baum, 1987; Ganster et al., 1982; O'Keeffe & Baum, 1990). Whereas it has been noted that occupational stress researchers have incorporated such measures into their research, researchers investigating police stress often have failed to follow suit.

9.2 Implications for management

The current research indicated that police officers were not more occupationally stressed than clerical workers, and that they responded in ways similar to individuals not engaged in police work. It is suggested that it is not the overall stress that distinguishes police from other occupational groups, it is the nature of the situations experienced at work that is different. When three of these situations were examined in detail, the psychophysiological responses to, and subjective impact of, specific situations were demonstrated. This research appears to be the first to demonstrate the stressful aspects of particular operational tasks performed by police officers as part of their occupation.

The differential nature of the responses to each task has implications for intervention. This is particularly true for the timing of intervention and management of occupational stress. For example, the high levels of negative feelings that continued following car accidents lends support to the need for CISD

following attendance at serious car accidents. However, the results of this study, and of another (Duckworth, 1991), also suggest that work situations do not have to be on the scale of a disaster or to be highly traumatic to have negative outcomes for police officers. Thus, interventions are also needed when police officers are driving to deliver a death notification, and while they are on the witness stand in court. Stress management may assist. Further, police management may lessen the stress experienced by police officers by providing further instruction in delivering a death notification and responding to the family. Role play may assist here. Changes to the judiciary system may help ease the stress experienced by police officers when in court. Given the amount of evidence to be remembered, coupled with long delays between the incident and court case, it would appear appropriate for police officers to be allowed to use notes during court and to read statements when giving their evidence in chief. It is suggested that such changes to giving evidence would greatly alleviate the stress experienced by police officers.

There is little doubt that police officers experience stress due to the nature of the tasks they must perform. The literature highlights the impact of organisational stressors on police officers (e.g., Brandt, 1993; Brown & Campbell, 1990; Crank & Caldero, 1991; Evans & Coman, 1993; Storch & Panzarella, 1996), and the current research highlights the impact of operational stressors on police officers. It is necessary for police organisations to change wherever possible to lessen the impact of organisational stress on police officers (Haines et al., 1996b; Steinman, 1988; Violanti & Aron, 1993). Further, police organisations must take responsibility for their police officers, and provide the support needed to minimise the stress experienced by police officers in the course of their work.

9.3 Implications for future research

The current research has highlighted a number of areas for future research. In general, it is evident that researchers investigating police stress should include comparison groups and psychophysiological measures into their designs. More specifically, there is a need to further examine the nature of work experiences and the ways in which police officers respond to them. The current research has highlighted the differential nature of work situations. The ways in which police officers respond psychophysiologically, subjectively, and psychologically (through cognitive appraisal and coping strategies used), at least in part, are context specific. Thus, in order to provide appropriate and effective intervention strategies for police officers, particular work situations need to be investigated empirically.

The role of cognitive appraisal in occupational stress should be the focus of future research. Whereas the role of cognitive appraisal has been considered in many studies in the general stress literature, it has been relatively neglected in the area of occupational stress. The psychophysiological correlates of cognitive appraisal also should be the focus of future research. Given that those individuals with high stress levels are more susceptible to diseases with a physiological basis, such as cardiovascular disease (Adler & Matthews, 1994), it is important to explore the role cognitive appraisal plays in the initiation of psychophysiological arousal. Since responses in the laboratory do not necessarily predict responsiveness in the field (Johnston et al., 1990; Johnston et al., 1993), it is crucial to investigate the relationships between cognitive appraisal and psychophysiological responses to real life situations.

In order to investigate the issues highlighted here, it is necessary to overcome the methodological difficulties experienced when using ambulatory recordings. The current research suggests investigators should consider guided imagery in the future. Until such methodological issues are addressed, the impact of specific

work situations on individuals will not be adequately detailed, and the role of cognitive appraisal in initiating psychophysiological responses to real life encounters will remain unknown.

The importance of occupational stress research has been highlighted by the costs borne by individual employees and the organisations in which they work. Costs to the individual have included poor physical health (Johnson et al., 1989; Melamed et al., 1992; Uehata, 1991), psychological distress and anxiety (Duckworth, 1991; Hills & Norvell, 1991; Sigler & Wilson, 1988; Stearns & Moore, 1990), drug and alcohol use (Beutler et al., 1988; Pendergrass & Ostrove, 1986; Violanti et al., 1983, 1985), suicide (Fell et al., 1980; Janik & Kravitz, 1994; Lester, 1993), decreased job satisfaction (Guppy & Rick, 1996; Jain et al., 1996; Jansen et al., 1996; Leong et al., 1996; Locker, 1996), and lowered quality of family life (Adams et al., 1996; Doby & Caplan, 1995; Kinnunen et al., 1996; Leiter & Durup, 1995; Rout, 1996; Rout et al., 1996). Disruptions at an organisational level have occurred through increased absenteeism (Cooper & Bramwell, 1992; Donaldson, 1993; Geurts et al., 1994; Harvey & Burns, 1994; Heaney & Clemans, 1995; Kompier & Di Martino, 1995; Parker & Kulik, 1995), work accidents (Cartwright et al., 1996; Lowenstein, 1991; Rundmo, 1995; Sutherland, 1993), and workers' compensation claims (Earnshaw & Cooper, 1991; Haines et al., 1996a). Stressed individuals also have indicated a greater intent to leave the organisation (Blix et al., 1994; Hotchwater et al., 1993; Hromco et al., 1995; Huebner, 1992; Parker & Kulik, 1995; Rahim & Psenicka, 1996; Sager, 1994). Research investigating the antecedents and consequences of occupational stress would aid organisations in promoting and maintaining a healthy, productive work environment. Such a working environment would be of benefit to all employees, irrespective of the type of work they performed.

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APPENDIX A

CONSENT FORM

UNIVERSITY OF TASMANIA
DEPARTMENT OF PSYCHOLOGY

STUDY OF MALE WORKERS

CONSENT FORM

I..... consent to participate in a study on stress to be conducted by Suzanne McLaren, under the supervision of Dr Iain Montgomery.

I am aware that the study involves the monitoring of my heart rate and blood pressure over two consecutive weeks, on days at work and days not at work. I am also aware that my heart rate and blood pressure needs to be measured at approximately 8 a.m. and 4 p.m. each day. I know that I will also be required to fill out two short questionnaires: Visual Analogue Scales and a Daily Activities Log. I acknowledge that I have received a sheet indicating what is required of me when I participate in the study.

I understand that all the information obtained through my participation in the study will be strictly confidential. I am aware that I can withdraw myself from the study at any time by indicating a wish not to proceed.

Signed.....

Date.....

I have explained this study and the implications of participation in it to this volunteer, and I believe that the consent is informed and that the subject understands the implications of participation.

Signed.....

Date.....

APPENDIX B

MATERIALS USED IN STUDY ONE

Background Information Sheet

Daily Activities Log

List of Recent Experiences

Recording Sheet

BACKGROUND INFORMATION SHEET

NAME.....

PHONE NUMBER.....

DATE OF BIRTH.....

MARITAL STATUS.....

NUMBER OF CHILDREN.....

YEARS IN THE ORGANISATION.....

YEARS IN CURRENT DEPARTMENT.....

On average, how many cups of coffee/tea/alcohol, combined, do you drink a day?.....

Do you smoke?.....
If yes, how many cigarettes do you smoke a day?.....

Are you taking any medication?
If yes, what type?
What is the medication for?

Does your family have a history of high blood pressure?

Does your family have a history of heart disease?

DAILY ACTIVITIES LOG

IDENTIFICATION NUMBER.....

DATE.....

Please note down the activities you have done at Work/Home today. Also indicate the time each activity took place, and the degree to which it was stressful for you (0 = not stressful; 1 = a little stressful; 2 = moderately stressful; 3 = very stressful).

Example:

10.00am	attended court	1

DAILY ACTIVITIES LOG

IDENTIFICATION NUMBER.....

DATE.....

Please note down the activities you have done at Work/Home today. Also indicate the time each activity took place, and the degree to which it was stressful for you (0 = not stressful; 1 = a little stressful; 2 = moderately stressful; 3 = very stressful).

Example:

10.00am	attended meeting	1

LIST OF RECENT EXPERIENCES

IDENTIFICATION NUMBER.....

DATE.....

If you have experienced, in the last twelve months, any of the events listed below, please circle the number corresponding to that event.

1. You or your family became much better off financially.
2. You had a major financial crisis.
3. You had continuous financial worry.
4. Continuing risk of being made redundant.
5. You were promoted.
6. You found out you were not going to be promoted.
7. Trouble or arguments with people at work or other difficulties.

8. You had a serious illness or injury.
9. You had a serious accident (eg. car accident).
10. You took more exercise and your fitness improved alot.
11. You took less exercise and your fitness worsened alot.

12. You became engaged.
13. You broke off an engagement.
14. You were married.
15. You separated from your wife.
16. Husband and wife got together again after separation.
17. You divorced.
18. Your wife began an extra-marital affair.
19. You experienced some sexual difficulties.

20. You took up a new spare time activity.
21. You joined an organisation or club for a spare time activity.
22. You stopped a spare time activity which you used to enjoy.
23. You left an organisation or club for a spare time activity.
24. You passed an important exam or had other important successes in your studies.
25. You failed an important exam or had other important failures in your studies.
26. You took an educational course and felt you had really increased your knowledge and skills.
27. Courses or studies seemed pointless.

28. Your wife died.
29. A child of yours died.
30. A close family member died, not including spouse or own child.
31. Your wife had an abortion, miscarriage or still-birth.
32. Serious problems or arguments with one or more of your children.
33. Behaviour of one of your parents/parents-in-law was a serious problem.
34. Behaviour of one of your brothers/sisters was a serious problem.

35. A friendship with someone of the same sex became much closer.
36. A friendship with someone of the same sex worsened or split up.
37. A close friend died.
38. You made lots of new friends.

39. You were robbed.
40. You were physically assaulted.
41. You had a civil suit.

42. You experienced a religious conversion.
43. You became much more actively involved in a church or religious organisation.
44. You lost your religious faith.

RECORDING SHEET

IDENTIFICATION NUMBER.....

DAY.....

DATE.....

TIME.....

ARE YOU AT WORK TODAY?.....

Please place a cross (X) to indicate your position along the two lines below.

Respond as you feel right now.

Comfortable or Calm _____ Worried or Uptight

Active or Energetic _____ Sleepy or Passive

Now Take your Blood Pressure.

Blood Pressure: Systolic.....

Diastolic.....

Heart Rate.....bpm

Have you eaten in the last hour?.....

Have you consumed coffee/tea/alcohol in the last hour?.....

APPENDIX C

INFORMATION FOR PARTICIPANTS

UNIVERSITY OF TASMANIA
DEPARTMENT OF PSYCHOLOGY

STUDY OF MALE WORKERS

Requirements for Participation (police officers)

*The 8 a.m. to 4 p.m. shift will be used in the study.

*Subjects will be required to measure their heart rate and blood pressure and fill in two short questionnaires **each day** for two consecutive weeks. Specifically, on days at work, subjects will be required to record measures for mood, heart rate and blood pressure (in that order) prior to the commencement of the shift. At the end of the shift, this procedure will be repeated, with subjects also noting down the tasks performed during their shift. On days **not** at work, subjects will keep a record of measures for mood, heart rate and blood pressure for the times of 8 a.m. and 4 p.m.. They will also note down the activities performed during the day.

*All information obtained is confidential. To facilitate this, names will not be placed on recording sheets, except the Background Information Sheet (this is so I can contact people who wish to be subjects). The Background Information Sheet will be kept separate from all other questionnaires completed by subjects.

*Taking blood pressure and heart rate: Whenever possible,

1) avoid consuming food, tea, coffee and alcohol up to one hour prior to taking measurements.
2) Sit quietly for ten minutes prior to taking measurements.

*If you have any questions, please phone me at the University on 20 2246 or at home on 23 1413.

Thank you for considering being a part of this study.

Suzanne McLaren

UNIVERSITY OF TASMANIA
DEPARTMENT OF PSYCHOLOGY

STUDY OF MALE WORKERS

Requirements for Participation (office workers)

*Subjects will be required to measure their heart rate and blood pressure and fill in two short questionnaires **each day** for two consecutive weeks. Specifically, on days at work, subjects will be required to record measures for mood, heart rate and blood pressure (in that order) prior to the commencement of work. At the end of work this procedure will be repeated, with subjects also noting down the tasks performed during their day. On days **not** at work, subjects will keep a record of measures for mood, heart rate and blood pressure for the times corresponding to commencing and finishing work (e.g, 9 a.m. and 5 p.m.). They will also note down the activities performed during the day.

*All information obtained is confidential. To facilitate this, names will not be placed on recording sheets, except the Background Information Sheet (this is so I can contact people who wish to be subjects). The Background Information Sheet will be kept separate from all other questionnaires completed by subjects.

*Taking blood pressure and heart rate: Whenever possible,

1) avoid consuming food, tea, coffee and alcohol up to one hour prior to taking measurements.
2) Sit quietly for ten minutes prior to taking measurements.

*If you have any questions, please phone me at the University on 20 2246 or at home on 23 1413.

Thank you for considering being a part of this study.

Suzanne McLaren

APPENDIX D

CONSENT FORMS

UNIVERSITY OF TASMANIA
DEPARTMENT OF PSYCHOLOGY

CONSENT FORM

A study is being conducted by Ms Suzanne McLaren, under the supervision of Dr Iain Montgomery and Dr George Wilson, in to the effects of different aspects of the police occupation on police officers. Participants in this study will be required to answer questions about their background, the way they think, feel and deal with work situations. In addition, measurements of heart rate, breathing, sweat response and muscle tension will be taken while you are asked to imagine a series of work experiences. In order to measure heart rate etc, a number of electrodes will be attached to your body and left hand. Placement of these electrodes will produce minimal discomfort and all electrodes have been disinfected so there is minimal risk of infection. Participation in this study is voluntary and you may withdraw from the study, without prejudice, at any time by indicating a wish not to proceed. If you have any questions or concerns about the study you may discuss them with Suzanne McLaren (phone 20 2250).

I have read the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this study and understand that I may withdraw, without prejudice, at any time. I agree that research data gathered for the study may be published provided that I can not be identified as a subject.

Signature of Subject..... Date.....

I have explained this study and the implications of participation in it to this volunteer, and I believe that the consent is informed and that the subject understands the implications of participation.

Signature of Investigator..... Date.....

UNIVERSITY OF TASMANIA
DEPARTMENT OF PSYCHOLOGY

CONSENT FORM

A study is being conducted by Ms Suzanne McLaren, under the supervision of Dr Iain Montgomery and Dr George Wilson, in to the effects of different aspects of the police occupation on police officers. Students in this study will be required to answer questions about their background, and the way they think, feel and deal with situations in their lives. In addition, measurements of heart rate, breathing, sweat response and muscle tension will be taken while you are asked to imagine life situations. In order to measure heart rate etc, a number of electrodes will be attached to your body and left hand. Placement of these electrodes will produce minimal discomfort and all electrodes have been disinfected so there is minimal risk of infection. Participation in this study is voluntary and you may withdraw from the study, without prejudice, at any time by indicating a wish not to proceed. If you have any questions or concerns about the study you may discuss them with Suzanne McLaren (phone 20 7664).

I have read the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this study and understand that I may withdraw, without prejudice, at any time. I agree that research data gathered for the study may be published provided that I can not be identified as a subject.

Signature of Subject..... Date.....

I have explained this study and the implications of participation in it to this volunteer, and I believe that the consent is informed and that the subject understands the implications of participation.

Signature of Investigator..... Date.....

APPENDIX E

MATERIALS USED IN STUDY TWO

Coping Resources Inventory

Primary Appraisal Scale

Secondary Appraisal Scale

Ways of Coping (modified)

COPE

Performance Measures

COPING RESOURCES INVENTORY

For the next sixty statements, circle the responses that best describe you in the last six months.

N = Never or rarely
S = Sometimes
O = Often
A = Always or almost always

1.	I have plenty of energy.	N S O A
2.	I say what I need or want without making excuses or dropping hints.	N S O A
3.	I like myself.	N S O A
4.	I am comfortable with the number of friends I have.	N S O A
5.	I eat junk food.	N S O A
6.	I feel as worthwhile as anyone else.	N S O A
7.	I am happy.	N S O A
8.	I am comfortable talking to strangers.	N S O A
9.	I am part of a group, other than my family, that cares about me.	N S O A
10.	I accept the mysteries of life and death.	N S O A
11.	I see myself as lovable.	N S O A
12.	I actively look for the positive side of people and situations.	N S O A
13.	I exercise vigorously 3-4 times a week.	N S O A
14.	I accept compliments easily.	N S O A
15.	I show others when I care about them.	N S O A
16.	I believe that people are willing to have me talk about my feelings.	N S O A
17.	I can show it when I am sad.	N S O A
18.	I am aware of my good qualities.	N S O A
19.	I express my feelings to close friends.	N S O A
20.	I can make sense out of my world.	N S O A
21.	My weight is within 5 lbs of what it should be.	N S O A
22.	I believe in a power greater than myself.	N S O A
23.	I actively pursue happiness.	N S O A

N = Never or rarely
S = Sometimes
O = Often
A = Always or almost always

24.	I can tell other people when I am hurt.	N S O A
25.	I encourage others to talk about their feelings.	N S O A
26.	I like my body.	N S O A
27.	I initiate contact with people.	N S O A
28.	I confide in my friends.	N S O A
29.	I can cry when I am sad.	N S O A
30.	I want to be of service to others.	N S O A
31.	I can say what I need or want without putting others down.	N S O A
32.	I accept problems that I can not change.	N S O A
33.	I know what is important in life.	N S O A
34.	I admit when I am afraid of something.	N S O A
35.	I enjoy being with people.	N S O A
36.	I am tired.	N S O A
37.	I express my feelings clearly and directly.	N S O A
38.	Certain traditions play an important part in my life.	N S O A
39.	I express my feelings of joy.	N S O A
40.	I can identify my emotions.	N S O A
41.	I attend church or religious meetings.	N S O A
42.	I do stretching exercises.	N S O A
43.	I eat well-balanced meals.	N S O A
44.	I pray or meditate.	N S O A
45.	I accept my feelings of anger.	N S O A
46.	I seek to grow spiritually.	N S O A
47.	I can express my feelings of anger.	N S O A
48.	My values and beliefs help me to meet daily challenges.	N S O A
49.	I put myself down.	N S O A
50.	I get along well with others.	N S O A

N = Never or rarely
S = Sometimes
O = Often
A = Always or almost always

51.	I snack between meals.	N S O A
52.	I take time to reflect on my life.	N S O A
53.	Other people like me.	N S O A
54.	I laugh wholeheartedly.	N S O A
55.	I am optimistic about my future.	N S O A
56.	I get enough sleep.	N S O A
57.	My emotional life is stable.	N S O A
58.	I feel that no one cares about me.	N S O A
59.	I am shy.	N S O A
60.	I am in good physical shape.	N S O A

Primary Appraisal

SCRIPT.....

Below is a list of words describing different emotions. Beside each word are four response alternatives. Circle the response alternative which best describes how you felt during the incident we have just discussed. Respond quickly! Respond with the first alternative that comes to your mind.

0 = The word **does not correspond** to how you felt during the incident
1 = The word **somewhat corresponds** to how you felt during the incident
2 = The word **almost corresponds** to how you felt during the incident
3 = The word **completely corresponds** to how you felt during the incident

Indifferent	0	1	2	3
Worried	0	1	2	3
Hopeful	0	1	2	3
Relaxed	0	1	2	3
Disappointed	0	1	2	3
Concentrated	0	1	2	3
Confident	0	1	2	3
Helpless	0	1	2	3
Satisfied	0	1	2	3

0 = The word **does not correspond** to how you felt during the incident
1 = The word **somewhat corresponds** to how you felt during the incident
2 = The word **almost corresponds** to how you felt during the incident
3 = The word **completely corresponds** to how you felt during the incident

Sad 0 1 2 3

Independent 0 1 2 3

Interested 0 1 2 3

Pumped Up 0 1 2 3

Doubtful 0 1 2 3

Irritated 0 1 2 3

Relieved 0 1 2 3

Uncertain 0 1 2 3

Alert 0 1 2 3

Secondary Appraisal

By using the following key:

0 = Does not apply
1 =Applies a little
2 =Applies somewhat
3 =Applies quite a bit
4 =Applies a great deal

Please indicate, by circling a number for each item, the extent to which the situation we have just discussed was one that:

You could change or do something about

0 1 2 3 4

You had to accept

0 1 2 3 4

You needed to know more before you could act

0 1 2 3 4

You could reasonably resolve with the available resources

0 1 2 3 4

Ways of Coping (modified)

Please read each item below and indicate, by circling the appropriate category, the extent to which you used it *during the situation you have just described.*

0 =Does not apply and/or not used
1 =Used somewhat
2 =Used quite a bit
3 =Used a great deal

1.	Tried to compromise to get something positive from the situation.	0 1 2 3
2.	Tried to obtain an overview of all possible action alternatives.	0 1 2 3
3.	Talked to someone to find out more about the situation.	0 1 2 3
4.	Tried to keep my feelings from interfering.	0 1 2 3
5.	Took a big chance or did something risky.	0 1 2 3
6.	Knew I shouldn't get angry, but got angry nonetheless.	0 1 2 3
7.	Made light of the situation, refused to get too serious about it.	0 1 2 3
8.	Thought about the smartest way to present my solution to the problem in order to get other people to accept it.	0 1 2 3
9.	Thought about the goals I had and what I really wanted from the situation.	0 1 2 3
10.	Made an effort to get additional information.	0 1 2 3
11.	Tried to keep my feelings to myself.	0 1 2 3
12.	I was careless with self-protective measures.	0 1 2 3
13.	Told myself not to be provoked and do something rash.	0 1 2 3
14.	Looked for the silver lining, so to speak; tried to look on the bright side of things.	0 1 2 3
15.	Tried not to burn my bridges but leave some things open somewhat.	0 1 2 3
16.	Tried to systematically weigh the pros and cons of the different action alternatives.	0 1 2 3
17.	Talked to someone who could do something concrete about the problem.	0 1 2 3

0 =Does not apply and/or not used
1 =Used somewhat
2 =Used quite a bit
3 =Used a great deal

18. Tried to stick to the problem and not take it personally.	0 1 2 3
19. Wished that the situation would go away or somehow be over with.	0 1 2 3
20. Felt anger towards the person(s) who caused the problem but tried to keep these feelings to myself.	0 1 2 3
21. Reminded myself how much worse things could be.	0 1 2 3
22. Accepted the next best thing to what I wanted.	0 1 2 3
23. Tried to analyse the problem in order to understand it better.	0 1 2 3
24. Asked someone else to take responsibility for some part of the problem.	0 1 2 3
25. Defined a plan of action and followed it.	0 1 2 3
26. Did not let it get to me, refused to think too much about it.	0 1 2 3
27. Had fantasies or wishes about how things might turn out.	0 1 2 3
28. Wished I had the right to do something drastic.	0 1 2 3
29. Told myself things that helped me feel better.	0 1 2 3
30. Tried to see things from the other person's point of view.	0 1 2 3
31. Came up with a couple of different solutions to the problem.	0 1 2 3
32. Thought as a police officer that I'm supposed to behave in certain ways.	0 1 2 3
33. I did something which I didn't think would work, but at least did something.	0 1 2 3
34. I went over in my mind what I would say or do.	0 1 2 3
35. Tried to get the person responsible to change his or her mind.	0 1 2 3

COPE

While thinking about the incident that we have just discussed, please indicate the extent to which you used each of the following strategies after the situation had ended.

1 =Not at all
2 =A little bit
3 =A medium amount
4 =A lot

1.	I tried to grow as a person as a result of the experience.	1 2 3 4
2.	I turned to work or other substitute activities to take my mind of things.	1 2 3 4
3.	I got upset and let my emotions out.	1 2 3 4
4.	I tried to get advice from someone about what to do.	1 2 3 4
5.	I concentrated my efforts on doing something about it.	1 2 3 4
6.	I said to myself "this isn't real".	1 2 3 4
7.	I put my trust in God.	1 2 3 4
8.	I laughed about the situation.	1 2 3 4
9.	I admitted to myself that I couldn't deal with it and quit trying.	1 2 3 4
10.	I restrained myself from doing anything too quickly.	1 2 3 4
11.	I discussed my feelings with someone.	1 2 3 4
12.	I used alcohol or drugs to make myself feel better.	1 2 3 4
13.	I got used to the idea that it happened.	1 2 3 4
14.	I talked to someone to find out more about the situation.	1 2 3 4
15.	I kept myself from getting distracted by other thoughts and activities.	1 2 3 4
16.	I day dreamed about things other than this.	1 2 3 4
17.	I got upset, and was really aware of it.	1 2 3 4
18.	I sought God's help.	1 2 3 4
19.	I made a plan of action.	1 2 3 4
20.	I made jokes about it.	1 2 3 4
21.	I accepted that this happened and that it couldn't be changed.	1 2 3 4

1 =Not at all
2 =A little bit
3 =A medium amount
4 =A lot

22. I held off doing anything about it until the situation permitted.	1	2	3	4
23. I tried to get emotional support from friends or relatives.	1	2	3	4
24. I just gave up trying to reach my goal.	1	2	3	4
25. I took additional action to try to get rid of the problem.	1	2	3	4
26. I tried to lose myself for a while by drinking alcohol or taking drugs.	1	2	3	4
27. I refused to believe that it had happened.	1	2	3	4
28. I let my feelings out.	1	2	3	4
29. I tried to see it in a different light, to make it seem more positive.	1	2	3	4
30. I talked to someone who could do something concrete about the problem.	1	2	3	4
31. I slept more than usual.	1	2	3	4
32. I tried to come up with a strategy about what to do.	1	2	3	4
33. I focused on dealing with this problem, and if necessary let other things slide a little.	1	2	3	4
34. I got sympathy and understanding from someone.	1	2	3	4
35. I drank alcohol or took drugs, in order to think about it less.	1	2	3	4
36. I kidded around about it.	1	2	3	4
37. I gave up the attempt to get what I wanted.	1	2	3	4
38. I looked for something good in what happened.	1	2	3	4
39. I thought about how I might best handle the problem.	1	2	3	4
40. I pretended that it hadn't really happened.	1	2	3	4
41. I made sure not to make things worse by acting too soon.	1	2	3	4
42. I tried hard not to prevent other things from interfering with my efforts at dealing with it.	1	2	3	4
43. I went to the movies or watched T.V. to think about it less.	1	2	3	4
44. I accepted the reality of the fact that it had happened.	1	2	3	4

1 =Not at all
2 =A little bit
3 =A medium amount
4 =A lot

45. I asked people who have had similar experiences what they did.	1	2	3	4
46. I felt a lot of emotional distress and I found myself expressing those feelings a lot.	1	2	3	4
47. I took direct action to get around the problem.	1	2	3	4
48. I tried to find comfort in my religion.	1	2	3	4
49. I forced myself to wait for the right time to do something.	1	2	3	4
50. I made fun of the situation.	1	2	3	4
51. I reduced the amount of effort I was putting in to solve the problem.	1	2	3	4
52. I talked to someone about how I felt.	1	2	3	4
53. I used alcohol or drugs to help me through it.	1	2	3	4
54. I learnt to live with it.	1	2	3	4
55. I put aside other activities in order to concentrate on this.	1	2	3	4
56. I thought hard about what steps to take.	1	2	3	4
57. I acted as though it hadn't even happened.	1	2	3	4
58. I did what had to be done, one step at a time.	1	2	3	4
59. I learnt something from the experience.	1	2	3	4
60. I prayed more than usual.	1	2	3	4

OUTCOME ITEMS

Think about the situation you have described once more. Consider how well you think you performed in this situation. If you had acted as you would do in your best moments, this ideal thought performance would be 100 per cent. Please indicate on the scale below how close to this ideal behavior you think you came in reality.

Performed at my best 100% | 50% | 0% Performed at my worst

Now consider, from a personal point of view, how well you think you handled the situation; that is, how do you think you coped during the situation.

Coped well 100% | 50% | 0% Coped poorly

Now consider, from a personal point of view, how well you think you coped after the situation had ended.

Coped well 100% | 50% | 0% Coped poorly

APPENDIX F

MATERIALS USED IN STUDY THREE

The Betts' QMI Vividness of Imagery Scale
Gordon Test of Visual Imagery Control
Stimulus-Response Inventory
Stress/Arousal Checklist
Perceived Stress Scale
Visual Analogue Scales

THE BETTS' QMI VIVIDNESS OF IMAGERY SCALE

The aim of this test is to determine the vividness of your imagery. The items of the test will bring certain images to your mind. You are to rate the vividness of each image by reference to an accompanying rating scale, reproduced below and on the top of the next page.

Before turning to items on the next pages, familiarise yourself with the different rating scale categories printed below and on the top of the next page. Please do not leave any page until you have completed the items on the page you are doing, and do not go back to check on completed items. Complete each set before moving on to the next set. Try to do each item separately, independently of how you might have done other items.

The image aroused by an item of this test may be:

Perfectly clear and as vivid as the actual experience.	Rating 1
Very clear and comparable in vividness to the actual experience.	Rating 2
Moderately clear and vivid.	Rating 3
Not clear or vivid, but recognisable.	Rating 4
Vague and dim.	Rating 5
So vague and dim as to be hardly discernable.	Rating 6
No image present at all, you only "know" that you are thinking of the object.	Rating 7

An example of an item on the test would be one which asked you to consider an image which comes to your mind's eye of a red apple. If your visual image was moderately clear and vivid you would check the rating scale and mark "3" in the brackets at the end of the item.

Now turn to the next page when you have understood these instructions and begin the test.

Here is the rating scale again in brief:

1 = Perfectly clear and vivid
2 = Very clear
3 = Moderately clear
4 = Recognisable
5 = Vague and dim
6 = Hardly discernible
7 = No image at all

Think of some relative or friend whom you frequently see, considering carefully the picture that rises before your mind's eye. Classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified on the Rating Scale.

Item	Rating
1. The exact contour of face, head, shoulders and body	( )
2. Characteristic poses of head, attitudes of body etc	( )
3. The precise carriage, length of step, etc. in walking	( )
4. The different colours worn in some familiar costume	( )

Think of seeing the following, considering carefully the image that comes to your mind's eye. Classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified on the Rating Scale.

Item	Rating
5. The moon as it is sinking below the horizon	( )

Think of each of the following sounds, considering carefully the picture which comes to your mind's ear. Classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified on the Rating Scale.

Item	Rating
6. The whistle of a locomotive	( )
7. The honk of an automobile	( )
8. The meowing of a cat	( )
9. The sound of escaping steam	( )
10. The clapping of hands in applause	( )

Think of "feeling" or touching each of the following, considering carefully the picture that comes to your mind's touch. Classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified on the Rating Scale.

Item	Rating
11. Sand	( )
12. Linen	( )
13. Fur	( )
14. The prick of a pin	( )
15. The warmth of a tepid bath	( )

Think of performing each of the following acts, considering carefully the picture that comes to your mind's arms, legs, etc. Classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified on the Rating Scale.

Item	Rating
16. Running upstairs	( )
17. Springing across a gutter	( )
18. Drawing a circle on paper	( )
19. Reaching up to a high shelf	( )
20. Kicking something out of your way	( )

Think of tasting each of the following, considering carefully the image that comes to your mind's mouth. Classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified on the Rating Scale.

Item	Rating
21. Salt	( )
22. Granulated (white) sugar	( )
23. Oranges	( )
24. Jelly	( )
25. Your favourite soup	( )

Think of smelling each of the following, considering carefully the image that comes to your mind's nose. Classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified on the Rating Scale.

Item	Rating
26. An ill-vented room	( )
27. Cooking cabbage	( )
28. Roast beef	( )
29. Fresh paint	( )
30. New leather	( )

Think of performing each of the following sensations, considering carefully the image which comes before your mind. Classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified on the Rating Scale.

Item	Rating
31. Fatigue	( )
32. Hunger	( )
33. A sore throat	( )
34. Drowsiness	( )
35 Repletion as from a very full meal	( )

GORDON TEST OF VISUAL IMAGERY CONTROL

You have just completed a questionnaire that was designed to measure the **vividness** of different kinds of imagery. In this present questionnaire some additional aspects of your imagery are being studied.

The questions are concerned with the ease with which you can **control** or **manipulate** visual images. For some people this task is relatively easy and for others relatively hard. One subject who could not manipulate his imagery easily gave this illustration. He visualised a table, one of whose legs suddenly began to collapse. He then tried to visualise another table with four solid legs but found it impossible. The image of the first table with its collapsing leg persisted. Another subject reported that when he visualised a table the image was rather vague and dim. He could visualise it briefly but it was difficult to retain by any voluntary effort. In both these illustrations the subjects had difficulty in controlling or manipulating their visual imagery. It is perhaps important to emphasise that these experiences are in no way abnormal and are as often reported as the controllable types of imagery.

Read each question, then close your eyes while you try to visualise the scene described. Each question is to be answered either YES, NO, or UNSURE, whichever is the more appropriate. Record your answers in the brackets ( ) by rating YES as 1, NO as 2, and UNSURE as 3.

Remember that your accurate and honest answers to these questions is most important for the validity of this study. If you have any doubts at all regarding the answer to a question, score it as UNSURE, ie 3. Please be certain that you answer each of the twelve questions.

Please turn the page and complete the items.

Ratings: YES = 1, NO = 2, UNSURE = 3.

Item	Rating
1. Can you see a car standing in the road in front of a house?	( )
2. Can you see it in colour?	( )
3. Can you see it in a different colour?	( )
4. Can you see the same car lying upside down?	( )
5. Can you see the same car back on its four wheels again?	( )
6. Can you see the car running along the road?	( )
7. Can you see it climb up a very steep hill?	( )
8. Can you see it climb over the top?	( )
9. Can you now see it get out of control and crash through a house?	( )
10. Can you now see the same car running along the road with a handsome couple in side?	( )
11. Can you see the car cross a bridge and fall over the side into the stream below?	( )
12. Can you see the car old and dismantled in a car wrecking yard?	( )

STIMULUS-RESPONSE INVENTORY

This inventory represents a means of studying people's reactions to and attitudes towards various types of situations. On the following pages are presented six situations which most people have experienced personally or vicariously through stories, etc. For each of the situations certain common types of personal reactions and feelings are listed. Indicate in the alternatives, by circling the number appropriate for you, the degree to which you show these reactions and feelings in the situations described.

1. You are going to meet a new date.

Heart beats faster	Not at all	1	2	3	4	5	Very much
Get an "uneasy feeling"	Not at all	1	2	3	4	5	Very much
Feel exhilarated and thrilled	Not at all	1	2	3	4	5	Very much
Perspire	Not at all	1	2	3	4	5	Very much
Need to urinate frequently	Not at all	1	2	3	4	5	Very much
Mouth gets dry	Not at all	1	2	3	4	5	Very much
Get full feeling in stomach	Not at all	1	2	3	4	5	Very much
Have loose bowels	Not at all	1	2	3	4	5	Very much
Experience nausea	Not at all	1	2	3	4	5	Very much

2. You are crawling along a ledge high on a mountain side.

Heart beats faster	Not at all	1	2	3	4	5	Very much
Get an "uneasy feeling"	Not at all	1	2	3	4	5	Very much
Feel exhilarated and thrilled	Not at all	1	2	3	4	5	Very much
Perspire	Not at all	1	2	3	4	5	Very much
Need to urinate frequently	Not at all	1	2	3	4	5	Very much
Mouth gets dry	Not at all	1	2	3	4	5	Very much
Get full feeling in stomach	Not at all	1	2	3	4	5	Very much
Have loose bowels	Not at all	1	2	3	4	5	Very much
Experience nausea	Not at all	1	2	3	4	5	Very much

3. You are getting up to give a speech before a large group.

Heart beats faster	Not at all	1	2	3	4	5	Very much
Get an "uneasy feeling"	Not at all	1	2	3	4	5	Very much
Feel exhilarated and thrilled	Not at all	1	2	3	4	5	Very much
Perspire	Not at all	1	2	3	4	5	Very much
Need to urinate frequently	Not at all	1	2	3	4	5	Very much
Mouth gets dry	Not at all	1	2	3	4	5	Very much
Get full feeling in stomach	Not at all	1	2	3	4	5	Very much
Have loose bowels	Not at all	1	2	3	4	5	Very much
Experience nausea	Not at all	1	2	3	4	5	Very much

4. You are going to a counseling bureau to seek help in solving a personal problem.

Heart beats faster	Not at all	1	2	3	4	5	Very much
Get an "uneasy feeling"	Not at all	1	2	3	4	5	Very much
Feel exhilarated and thrilled	Not at all	1	2	3	4	5	Very much
Perspire	Not at all	1	2	3	4	5	Very much
Need to urinate frequently	Not at all	1	2	3	4	5	Very much
Mouth gets dry	Not at all	1	2	3	4	5	Very much
Get full feeling in stomach	Not at all	1	2	3	4	5	Very much
Have loose bowels	Not at all	1	2	3	4	5	Very much
Experience nausea	Not at all	1	2	3	4	5	Very much

5. You are entering a competitive contest before spectators.

Heart beats faster	Not at all	1	2	3	4	5	Very much
Get an "uneasy feeling"	Not at all	1	2	3	4	5	Very much
Feel exhilarated and thrilled	Not at all	1	2	3	4	5	Very much
Perspire	Not at all	1	2	3	4	5	Very much
Need to urinate frequently	Not at all	1	2	3	4	5	Very much
Mouth gets dry	Not at all	1	2	3	4	5	Very much
Get full feeling in stomach	Not at all	1	2	3	4	5	Very much
Have loose bowels	Not at all	1	2	3	4	5	Very much
Experience nausea	Not at all	1	2	3	4	5	Very much

6. You are entering a final examination in an important course.

Heart beats faster	Not at all	1	2	3	4	5	Very much
Get an "uneasy feeling"	Not at all	1	2	3	4	5	Very much
Feel exhilarated and thrilled	Not at all	1	2	3	4	5	Very much
Perspire	Not at all	1	2	3	4	5	Very much
Need to urinate frequently	Not at all	1	2	3	4	5	Very much
Mouth gets dry	Not at all	1	2	3	4	5	Very much
Get full feeling in stomach	Not at all	1	2	3	4	5	Very much
Have loose bowels	Not at all	1	2	3	4	5	Very much
Experience nausea	Not at all	1	2	3	4	5	Very much

Stress/Arousal Checklist

Please answer the following question according to how you feel *right now.* Answer each item by marking the response to indicate:

1 = Definitely not

2 = Not sure *or* don't understand

3 = Slightly yes

4 = Definitely yes

Right now, do you feel:

1.	calm	1	2	3	4
2.	contented	1	2	3	4
3.	active	1	2	3	4
4.	vigorous	1	2	3	4
5.	comfortable	1	2	3	4
6.	lively	1	2	3	4
7.	uneasy	1	2	3	4
8.	tired	1	2	3	4
9.	aroused	1	2	3	4
10.	worried	1	2	3	4
11.	uptight	1	2	3	4
12.	drowsy	1	2	3	4
13.	tense	1	2	3	4
14.	relaxed	1	2	3	4
15.	passive	1	2	3	4
16.	energetic	1	2	3	4
17.	alert	1	2	3	4
18.	bothered	1	2	3	4
19.	sleepy	1	2	3	4
20.	distressed	1	2	3	4

PERCEIVED STRESS SCALE

The questions in this scale ask about your feelings and thoughts during the last month. In each case, you will be asked to indicate *how often* you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each item fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems reasonable to you.

For each question, choose from the following alternatives:

0 =Never

1 =Almost never

2 =Sometimes

3 =Fairly often

4 =Very often

1.	In the last month, how often have you been upset because of something that happened unexpectedly?	0 1 2 3 4
2.	In the last month, how often have you felt that you were unable to control the important things in your life?	0 1 2 3 4
3.	In the last month, how often have you felt nervous or "stressed"?	0 1 2 3 4
4.	In the last month, how often have you dealt successfully with irritating life hassles?	0 1 2 3 4
5.	In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?	0 1 2 3 4
6	In the last month, how often have you felt confident about your ability to handle your personal problems?	0 1 2 3 4
7.	In the last month, how often have you felt that things were going your way?	0 1 2 3 4

8.	In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1	2	3	4
9.	In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4
10.	In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
11.	In the last month, how often have you been angered because of things that happened that were outside of your control?	0	1	2	3	4
12.	In the last month, how often have you found yourself thinking about things that you have to accomplish?	0	1	2	3	4
13.	In the last month, how often have you been able to control the way you spend your time?	0	1	2	3	4
14.	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

Visual Analogue Scales

Script .....

Setting the Scene

Relaxed — Tense

How did you feel: |_____|

Calm — Angry

How did you feel: |_____|

Unafraid — Afraid

How did you feel: |_____|

Happy — Sad

How did you feel: |_____|

Normal — Unreal

How did you feel: |_____|

Normal — Numb

How did you feel: |_____|

How well were you
able to image that scene:

Clear — Not Clear

|_____|

How close was that
scene to real life:

Close — Not Close

|_____|

Approach

Relaxed — Tense

How did you feel: ⌊———————————————————⌋

Calm — Angry

How did you feel: ⌊———————————————————⌋

Unafraid — Afraid

How did you feel: ⌊———————————————————⌋

Happy — Sad

How did you feel: ⌊———————————————————⌋

Normal — Unreal

How did you feel: ⌊———————————————————⌋

Normal — Numb

How did you feel: ⌊———————————————————⌋

How well were you
able to image that scene:

Clear — Not Clear

⌊———————————————————⌋

How close was that
scene to real life:

Close — Not Close

⌊———————————————————⌋

Incident

Relaxed Tense

How did you feel: |_____|

Calm Angry

How did you feel: |_____|

Unafraid Afraid

How did you feel: |_____|

Happy Sad

How did you feel: |_____|

Normal Unreal

How did you feel: |_____|

Normal Numb

How did you feel: |_____|

How well were you
able to image that scene:

Clear Not Clear

|_____|

How close was that
scene to real life:

Close Not Close

|_____|

Consequence

Relaxed Tense

How did you feel: |_____|

Calm Angry

How did you feel: |_____|

Unafraid Afraid

How did you feel: |_____|

Happy Sad

How did you feel: |_____|

Normal Unreal

How did you feel: |_____|

Normal Numb

How did you feel: |_____|

How well were you
able to image that scene:

Clear Not Clear

|_____|

How close was that
scene to real life:

Close Not Close

|_____|

APPENDIX G

EXAMPLES OF TYPICAL IMAGERY SCRIPTS

CAR ACCIDENT SCRIPT

1. Setting the Scene

Right. Picture yourself driving a police car along Main Road. Really see yourself in the car in uniform. Feel the steering wheel in your hands. Picture the police car. Really see the white car with lights on top. There is traffic around you as you drive north. See the shops each side of the road. Picture the people walking along the street. It is quite busy at this time of the afternoon. It is a really nice day. Picture the blue sky and the sun shining. You have your sunglasses on. Remember the sun was shining brightly in to the police car. Concentrate on how you feel right now (pause). You are nearing the end of your shift. It has been easy going, and you are looking forward to knocking off. Really see yourself driving the car along Main Road. Hear the voice come on the police radio. Really hear the male voice say there has been an accident. A child has been hit by a car. Pick up the hand piece and respond. Really hear your voice as you say you will attend. There aren't many details. You don't know what to expect. Put your siren and lights on. You need to get going. Really remember how you felt when you first got the job on the radio. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

2. Approach

Right. Picture yourself driving a police car along Main Road. You are on your way to an accident. Picture the police car with the lights flashing. Hear your siren. Feel the steering wheel in your hands as you drive. You don't know what to expect. There are few details. Picture yourself driving the police car through the traffic. Some people don't move out the way. They frustrate you. Picture the police car in the clear now. Put your foot down a bit more. It is safe to drive faster. Feel the adrenalin pump as you drive along the road. Really feel your heart beat faster. It is exhilarating to drive faster. Concentrate on that feeling right now (pause). Picture yourself coming to the turn off. Slow down, and turn the corner. Really turn the corner and accelerate. As you drive, think about what you might see at the accident. You hope it isn't a bad accident. Hope, too, that you don't know the people involved. Think about police procedures. Really think about what you have to do once there. Sense all of these thoughts rushing through your mind as you drive. Look ahead. See the traffic stopped. Picture the people standing around. You have found the accident. Really feel your heart beat and the adrenalin pump as you come to the accident. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

3. Incident

Right. Picture yourself running to the accident. Really run to the accident scene. See the blue Laser. Picture the broken windscreen and dented bonnet. See the blood on the car. Really see it there. Look to the side. Picture the people standing around someone on the ground. Run over. See the girl there. Really see her. Picture her light coloured hair. See the blood in it. Picture her pale face. There is blood running down her small face. There is a huge, deep cut in her face. You can see right in to her head. Picture the little girl there. This is bad. Really bad. You feel a bit sick. You know she is going to die. Really remember how you felt when you saw the girl. Concentrate on how you feel right now (pause). Get down on the ground. Really get down to her. Feel for a pulse. Feel her skin against your fingers. You can't find a pulse. She isn't breathing either. You need to start CPR. Lift her shirt. See her little body. She is in a bad way. Start

breathing in to her mouth. Do heart compressions too. Really do CPR on the girl. You know she is going to die. But you must do something. In the background, hear the ambulance coming. You feel a bit relieved. Soon, they will be here to take over. Keep doing CPR. Really remember what it was like at the scene of the accident. Remember how you felt doing CPR on the little girl. Concentrate on how you are feeling right now (pause). Now open your eyes and switch that scene off.

4. Consequence

Right. Picture yourself at the accident scene. Really see yourself doing CPR on the little girl. You know she is going to die. See the ambulance officers arrive. Really see them there. You are so relieved. Picture them taking over. See them working on her. Offer assistance to them. See them try everything. There is nothing that can be done. The little girl is dead. Picture her lying there. There was nothing anyone could do. You feel a bit sick. Recall that she looks like your niece. She is about the same age and build. You feel really sick thinking this. It could easily have been your niece. Concentrate on how you feel right now (pause). The accident investigation guys are there now. Really see them. You are a bit relieved. It is their case now. You are off the hook. Picture yourself walking back to the police car. Really walk away from the accident scene. It is past your knock off time. You just want to go home. You are tired and feel a bit sick. Really feel it in your stomach. You didn't need this. Picture yourself driving away from the accident scene. Really drive the police car back towards the police station. Remember how you felt when you were leaving the accident scene. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

DEATH NOTIFICATION SCRIPT

1. Setting the Scene

Right. Picture yourself in the muster room at Glenorchy Police Station. Really see yourself there in uniform. Picture the creamy coloured lino on the floor. See the painted besser brick walls too. See the desks and chairs in the muster room. There are typewriters on the desks. Picture the windows that look out to Main Road. See the venetian blinds on the windows. Picture the four drawer filing cabinets along the wall. See the lockers and the pigeon holes too. Really see the muster room. Concentrate on how you feel right now (pause). Picture yourself on the telephone. Really feel the telephone in your hand. You are speaking to someone in the radio room. Hear the male voice on the telephone. Hear them tell you that someone has died. Really hear the details of the person and the address to go to. A young guy has hit a tree. He was killed instantly. Really hear the voice tell you that the parents don't know. You must tell them. Hang up the telephone. Remember you thought "Why me?". Really think that. You feel very uncomfortable. You don't want to do this. Really remember how you felt when you were given this job. Concentrate on that feeling right now (pause). Now open your eyes and switch that scene off.

2. Approach

Right. Picture yourself in the passenger seat of the police car. Really see yourself there. Picture your partner driving the car. Picture yourself being driven to the address. It is dark outside. See the car lights against the dark night. Think about

the job. You will be doing the talking. You don't want to do this, but you have to. Really think about what to say. Think of the words you should and shouldn't use. You want to be compassionate, but at the same time you have a job to do. Really sense these thoughts going through your mind. As you think, feel the butterflies in your stomach. You feel sick. Really notice that horrible feeling in your stomach as you are driven to the address. Concentrate on that feeling right now (pause). Picture the police car arriving at the address. Really see the brown brick house there. See the concrete driveway. Picture the small, neat garden. It is all very well kept. Picture you and your partner getting out of the car. Really open the door and get out. Close the door behind you. Picture the two of you walking to the gate. See the white gate there. Open it, and go through. You are feeling sick and nervous as you walk to the front door. Really walk towards the door. Picture the glass door in front of you. Raise your hand and knock loudly. Really feel the glass under your knuckles as you knock hard. Concentrate on what to say as you stand and wait. You feel sick and nervous as you wait. Concentrate on those feelings right now (pause). Now open your eyes and switch that scene off.

3. Incident

Right. Picture you and your partner at the house. Really see the two of you waiting for someone to answer the door. Picture the light coming on in the house. Someone is home. Your nervous feeling increases. You know you have to do this now. Really think of what to say as you wait. Picture the shadow coming closer to the door. See the door open. Really see the woman there. Picture the middle-aged woman there in her blue dressing gown. See her face. She is so shocked to see you. Identify yourself. Hear her voice ask what is wrong. Really hear her voice as asks. Ask her if it is OK to come in. Picture you and your partner going in to the house. Really walk in. Concentrate on how you feel right now (pause). See the look on her face. See her husband too. Picture the two of them holding hands. They know something is wrong. Remember how you told them. Really hear your voice as you tell them you have some bad news. Tell them about their son. Tell them him has had a car accident; that he has died. See the couple there. See their faces. Hear the mother scream. Really hear her. The father just shakes his head. He can't believe it. Really see them. Their whole world has fallen apart. You feel so sorry for them. But remember, too, that you felt a bit relieved once you told them. You have mixed feelings at this point. Concentrate on those feelings right now (pause). Now open your eyes and switch that scene off.

4. Consequence

Right. Picture the four of you in the house. Really see the parents there. They are devastated. You feel a bit sorry for them, but a bit relieved too. The mother can not believe it. Really hear her saying it is not true. Hear her...she can not believe it. See her husband try to comfort her. Picture him holding her. Really see them there. Hear yourself ask if you can contact anyone for them. Offer to put the kettle on. Really ask if there is anything you can do. There is nothing you can do. You feel like you are intruding on their grief now. You really want to get out of there. Really remember how you felt at this point. Concentrate on how you feel right now (pause). There is nothing more you can do. Picture you and your partner leaving the house. Really leave the house. It is a great relief to leave. It is so good to get outside. Picture yourself walking back to the car. Have a chat to your partner. He is relieved to be out too. Get in to the car. Picture yourself in the passenger seat. Think about the couple inside the house.

You feel sorry for them. You know what it is like to lose someone close to you. It is so horrible. Picture the car driving away from the house. Really leave the area. You hope you don't have to do this again. You hate it. Really think about not wanting to do this again. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

COURT SCRIPT

1. Setting the Scene

Right. Picture yourself waiting in the hallway outside court number 2. Really see yourself there in uniform. Picture the brown carpet on the floor. See that the walls are made out of wood. Really see the light stain on the wood. Up one end of the hallway, towards Liverpool Street, see the set of doors. There is an office there. Picture the noticeboard. See the set of steps going down to the road. Up the other end, see another set of double doors which are always open. See the waiting room straight ahead, and the telephone box on the left. Really picture yourself waiting in the hallway. Concentrate on how you feel right now (pause). Picture yourself standing in the hallway. Sense the evidence going through your head. It is a complex case. Really try to remember all the details of the case. You have to get it all straight. Picture your notes in your hat. Really see the notes in there. Go over the details. Sense them going through your mind. Your palms are sweating as you go over the details. Notice the sick feeling in your stomach. Really feel the butterflies. You must remember all the details of the case. Really focus on how you were feeling as you waited to go in to court. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

2. Approach

Right. Picture yourself waiting in the hallway outside court number 2. You are nervous as you wait. Picture the security guard standing there. Hear him call your name. It is time to go in. Go to the door. Picture yourself standing just inside the door. Look around. See all the wood panelling. To the right, see the civilian area. To the left, picture the press box. See the magistrate too. Picture the magistrate sitting up high. He is in his mid forties and of average build. See the clerk of the court in front of the magistrate. Picture the defence counsel and the defendant on the left. Really look at the defendant. Remember you thought, you bastard. On the other side, see the prosecutor. Really picture the court room. Concentrate on how you feel right now (pause). Bow to the magistrate and walk in to the court room. Really walk towards the witness box. Picture the witness box. It is like a pedestal. Bow to the magistrate, and walk up the stairs. Picture yourself standing up there. You are a bit nervous as you wait up there. Really feel your stomach churning as you wait to give your evidence. Sense all of the details going through your head. You don't want to make a mistake. Really remember how you felt just prior to giving your evidence. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

3. Incident

Right. Picture yourself in the witness box. You have just given your evidence in chief. Feel relieved because it has gone well. But you know the questions are to come. Picture the defence counsel there. He is a sleezy man. See him standing before you. Hear him ask questions about what you have said. Stay cool. Think

before you answer. Clarify issues, but keep your answers short. Don't let him trip you up. You are doing OK, but are worried about what might come. Feel your hands sweat as you stand there. Your heart is beating quickly. Listen carefully to his questions and answer confidently. Really remember what it was like in the witness box. Concentrate on how you feel right now (pause). Hear him ask about where you were standing just prior to the arrest. Really hear his voice. Tell him where you were. Hear him ask how it was possible to see from where you were. Doubt creeps in to your mind. You know what you saw, but can not describe how you saw it from your position. Think quickly. You start to stutter. Your confidence is gone. Hear the magistrate ask you a question. He wants to clarify what you saw and from where you saw it. You are sweating heavily all over. Really feel the sweat trickling down your forehead. You feel angry. You know what you saw. Really remember what it was like at this point in court. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

4. Consequence

Right. Picture yourself in the witness box. Things are not going well. The defence counsel keeps harping on the position you were in and what you saw. Really hear his voice as he discredits you. You are angry, really angry. Feel your heart pump as you stand there. There is nothing you can do. See the defendant. Picture the smirk on his face. He is a bastard. You feel like an idiot. Hear the defence counsel say no more questions. Picture the prosecutor standing up. Hear him ask again about what you saw. Tell him. You are angry at the prosector for not coming in earlier. He is useless. Really remember how you felt at this point. Concentrate on how you feel right now (pause). Hear the magistrate say you can leave. Really hear those words. You feel so relieved. Really feel relieved. Walk out. Turn and bow. Leave the court room. It is so good to get out. Walk along the hallway. Go down the steps. Picture yourself outside. It is so good. Feel the fresh air on your face. You are dripping with sweat. It hasn't gone well. But you are not so angry now. It is over. You can't do anything. Really feel relieved as you walk along the street. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

INTERVIEW SCRIPT

1. Setting the Scene

Right. Picture yourself in the reception area, waiting to be called for the interview. Really put yourself there. Picture yourself sitting on the long padded bench seat. You are wearing black slacks and a white shirt. Picture your coloured tie. Look around. See the white wall in front of you. See the blue carpet on the floor. Look to the left. See the window for reception there. In reception, see the desk, computer, tables and chairs. Picture the woman working there. Look to the right. Picture the long corridor up there. See the doors on both sides. See where the corridor turns to the left. Really picture yourself sitting in reception waiting for the interview. Concentrate on how you feel right now (pause). Picture yourself sitting and waiting. As you wait, think about the job. You really want this job. Think, too, about who might be on the interview panel. You hope they are nice. Think about what they might ask. Think of your strengths and weaknesses. Try to prepare yourself for the questions. You are nervous waiting there. Feel the butterflies in your stomach. Your palms are a little sweaty. Really remember how you felt when you were sitting and waiting

for the interview. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

2. Approach

Right. Picture yourself waiting to be called for the interview. See a man coming down the corridor. Really see him there. He is in his thirties, and is wearing a black suit. Picture him there. He looks cheerful and happy. He greets you. Shake his hand. Really feel his hand in yours. Hear him say come to the room. Walk towards the room. As you walk, think about the interview. Get your ideas straight in your head. Think, too, about the other people on the panel. At least this guy seems nice. Really walk to the door of the interview room. Concentrate on how you feel right now (pause). Picture yourself standing at the entrance of the interview room. Look around. See the desk in the far right corner. In front of that, picture the three chairs. Picture the bookshelf, with books and things on it. See the other people in the room. See the older lady sitting on a chair, and another man sitting there too. Take a seat. Really sit down. Feel the chair beneath you. Try to sit straight, and slightly forward. Really be aware of your posture. See the three people in front of you. You are feeling nervous as you sit and wait for the interview to start. Feel the sweat on your palms. Feel your heart beating a little faster than usual. You really want this to be over with. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

3. Incident

Right. Picture the four of you in the interview room. The interview has begun. They are asking straight forward questions. You are feeling OK as you answer the questions. Feel your confidence grow. You are not so nervous now. Listen to each question and think before answering. Hear the lady ask a question. Really hear her quiet voice. Remember she asked what you would do if a client came up to you and started yelling. Really hear her ask. You are not prepared for this question. Concentrate on how you feel right now (pause). Try to think of an answer to her question. You are a bit thrown by it. Feel your face start to go red. You don't know what to say. Think about other courses you have done. Think of something, anything. They are all staring at you, waiting for an answer. Start talking. Really hear your voice as you ramble on and on. You throw in some big words, but you are not sure of what you are saying. Feel yourself start to lose confidence. Really feel the nervousness grow. The sweat is starting to pour down your neck. You are feeling tense and nervous. Feel your hands shake and sweat. You have lost it. Really remember what it was like when you lost it in the interview. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

4. Consequence

Right. You are still in the interview. You have been rambling on, trying to answer the lady's question. Hear one of the men step in to help you. Hear his voice. He knows you have lost the plot. Try to clarify what you have said. It is not much use. You have blown the interview. You feel angry with yourself. You are a bit embarrassed too. Hear them ask a few other questions. Answer them quietly. Your confidence has gone. Really remember how you felt towards the end of the interview. Concentrate on how you feel right now (pause). Hear them wrap the interview up. You feel a bit relieved that it is over. Shake their hands. Really hold out your sweaty hand and shake their hands. Picture yourself

walking out of the interview room. It is a relief to be out. Walk along the corridor back to reception. Open the door, and walk out of the building. Really leave the building. It feels so good to be out. Feel the fresh air. Take a few deep breathes. You can't believe you blew it. Remember how disappointed you felt after the interview. But you feel relieved it is over. Walk down the street. Really feel glad that it is over. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

EXERCISE SCRIPT

1. Setting the Scene

Right. Picture yourself running on Melafont Street. Really see yourself there. See that you are wearing blue running shorts, a red t-shirt, Niké shoes and white socks. Picture your black bag on your back. Really feel your bag against your back and the straps on your shoulders. Picture the strap around your chest and around your waist. Really feel how comfortable and firm your bag is on your body. It is a great day. Picture the blue sky. See the few white fluffy clouds in the sky. See the sun shining. Feel the weak cool breeze blowing around you. Really picture yourself running along the street. Concentrate on how you feel right now (pause). Picture yourself running past the bus stop. Really see the wooden bus shelter there, and the red bus sign. You are feeling good as you run past the bus stop. As you run past the bus stop, see the little park area. On the left side, see the corner shop. It is an old shop, with signs out the front. Picture yourself running fairly fast. You are feeling good as you run. Really feel all the endorphins rushing through your system. Feel the enjoyment of running. It is fun. Really remember how you felt when you were running along Melafont Street. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

2. Approach

Right. Picture yourself running along Melafont Street. Really see yourself there, carrying your bag. You are feeling happy and relaxed as you run. See the small road. Run across it. Really run along Melafont Street. Feel your feet hit the pavement as you run. Picture the new age shop. It is all bright colours. See the wind chimes and transfers in the window. It looks great. Picture the old fences and the huge weeds as you run. Picture the run down old house too. It needs to be pulled down. Keep running. You feel great as you run. Concentrate on how you feel right now (pause). As you run, see the start of the slope. Don't look directly up the hill. Just focus on certain areas in front of you. Look at the designated areas. Keep running. See the four steps. Picture the grey concrete steps there. Picture the iron pipe hand rail too. Really see yourself on the right hand side of the hill. Picture the trees along the side. Go up the steps. Feel your legs as you lift them. Really run up the steps. It feels good to go up the steps. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

3. Incident

Right. Picture yourself running up the hill. See the bitumen path there. Feel your bag against you as you run. Feel your legs as you run. Really run up the hill. It is hard running up there. You can't keep the same pace. See that your pace is halved. Pump your arms. Really feel your arms as you pump them to get

up the hill. Try to keep your body fairly upright. Really work hard to keep running up the hill. It is not easy, but you can do it. Pump your arms hard. Keep your legs going too. Feel your thigh muscles and your calves as you keep running up the hill. Concentrate on how you feel right now (pause). Try to push the pace as you go up the hill. Really try to keep the rhythm going. Push the length of pace too. Keep going up. It gets harder. Picture yourself on the other side of the second set of steps. The degree of slope increases. Keep going. Feel your legs. They are a bit sore. Feel your heart and lungs. They feel like they are bursting. Feel the pain. Keep running up the hill. Feel your heart beat hard and fast. It feels like it will explode. Concentrate on not giving up. You must get to the top of the hill. Really remember what it is like when you are running up the hill. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

4. Consequence

Right. Picture yourself coming to the top of the hill. Really see yourself there. Your heart is pumping, really pumping. There is not enough oxygen getting in to your system. Really feel it. It feels like you should stop. But keep running. Picture the guide rail there. See that you can't go straight across Mt Stuart Road. Run around to the right a bit. Cross Mt Stuart Road. Watch for cars coming down around to the left. Really go across the road. Picture yourself on the other side of the road. See all of the houses there. They are very neat and have nice gardens. It is a great view too. Really see yourself running along the street. Concentrate on how you feel right now (pause). As you run, notice that you haven't got much energy left. Really feel your whole body as you keep running. Keep running towards your house. Really see your house near the corner. It is a welcome sight. Run right to your letter box. Picture the green metal letter box in front of you. Stop running. Really stop. You are exhausted. Really feel the sheer physical exhaustion. It is a great relief to be home. Really feel the relief. Notice your heart beating quickly, and the sweat pouring off your whole body. You are so wet. Really remember what it is like when you first stop running. Concentrate on how you feel right now (pause).

NEUTRAL SCRIPT

1. Setting the Scene

Right. Picture yourself standing at the door to your kitchen. Really see yourself there. Look around. See the new blue lino on the floor. See the light blue walls. Look down in to the kitchen. Picture the new white stove there. See the fridge on the left side. See the wall with the kitchen sink. Really see the shiny silver sink there. Picture the white and blue tiles around the sink. See the shelves behind the sink. Look at the white cupboards all around the kitchen. Picture the light brown pantry coming out from the wall. Really picture the kitchen and you standing at the door. Concentrate on how you feel right now (pause). See the white bench in the kitchen. Look at all the things on the bench. Picture the flowers on the bench, and the pot plant too. See the bowl that you put bits and pieces in. See the dark blue pottery bowl, with the yellow flowers on it. In front of that, picture the wooden fruit bowl. See the kettle on the tile, on the bench. Picture the kettle there. It is white, and rounded. Picture the handle on top. See the grey lid covering the spout. Picture the plug in the back. Really picture your kitchen. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

2. Approach

Right. Picture yourself in your kitchen. Go to the kettle. See the kettle there on the tile on the bench. Lift up the kettle. See if there is enough water in it. Really feel the weight of the kettle in your hand. There is enough water in it. Put the kettle back down. Plug the cord in to the power point. Turn the kettle on. Bend down to the cupboard. Put your fingers around the knob. Pull the cupboard door open with your right hand. Look inside the cupboard. On the top shelf, see the dinner set. Underneath, picture all the coffee mugs and glasses. Picture the white cup with the rose on it. Really see it there. Pick it up by the handle. Really feel it in your hand. Put it down on the bench. Picture it there, next to the kettle. Concentrate on how you feel right now (pause). Look up to the shelf. See the glass containers there. They have tea bags, milo and coffee in them. Reach for the coffee jar. See the coffee in the glass jar. Grab the coffee with your left hand. Bring it down to the bench. You need a teaspoon. Picture the drawers under the bench. Open the top drawer with your right hand. Look inside. Picture the five divisions. See the teaspoons across the front. Pick up a teaspoon with your right hand. See the teaspoon. It is silver with a flowery pattern on it. Feel it in your hand. Close the drawer. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

3. Incident

Right. Picture yourself standing at your cup, with a teaspoon. Put the teaspoon down. Hold the coffee jar with your left hand. Pull the lid off with your right hand. Smell the coffee. It is a strong smell. Put the lid upside down on the bench. Pick up the teaspoon. Really get a teaspoon of coffee. Put the teaspoon right down into the cup. Put the lid on the coffee. Put the coffee back on the shelf. Get the sugar down with your left hand. Really picture the sugar bowl. It is a pottery container. See the very pale rose creamy coloured bowl, with some blue and black flowers on it. Put the sugar bowl on the bench, with the cup. Concentrate on how you are feeling right now (pause). Hold the lid of the sugar bowl. Use the teaspoon to get the sugar out. Picture yourself putting two teaspoons of sugar into the cup. Put the lid back on. Put it back up on to the shelf. Swivel to the left, to the fridge. Open the fridge with your right hand. See the light come on in the fridge. Feel the cold of the fridge as you open the door. Look inside the door of the fridge. See the milk on the bottom shelf. Really see the two litre plastic container of milk there. See the green lid. Grab the plastic handle with your right hand. Close the fridge door. Swivel back around to the cup. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

4. Consequence.

Right. Picture yourself at the bench. You have the milk. Take the lid off the milk with your left hand. Put the lid down. Pour the milk into the cup. Really pour it. Look into the cup as you pour. See the brown of the coffee disappear. See that it is all white. See the coffee come to the top. Really see it. Hear the kettle whistle. Really hear it boil. You know what it sounds like. Reach over and switch the kettle off. Pull the plug out of the wall. Hold the cord in your right hand. Lift the kettle up. Feel the cord and the handle in your hand. The kettle feels heavy as you lift it. Pour the water into the cup. Watch the cup as you pour the water in. See the steam coming from the kettle. Feel the heat coming out of the kettle too. See the coffee dissolving. See the water changing to a light brown colour as you pour. Picture the bits floating on top of the coffee.

Put the kettle back down on the tile. Concentrate on how you feel right now (pause). Hold the handle of the cup. Grab the teaspoon. Stir the coffee. Really stir it quite a bit. You want the sugar flavour to come through. Put the teaspoon in the sink. Hear the sound it makes against the steel sink. Pick the cup up with your right hand. Really feel your right hand around the handle. Feel the warmth of the cup. Feel your fingers against the side of the cup. You are really looking forward to the cup of coffee. Concentrate on how you feel right now (pause). Now open your eyes and switch that scene off.

APPENDIX H

MEANS AND STANDARD DEVIATIONS FOR THE CLEAR/NOT CLEAR AND CLOSE/NOT CLOSE VISUAL ANALOGUE SCALES

Table A1. Mean and standard deviation ratings on the Clear/Unclear and Close/Not Close VASs for each stage of each script for both groups.

	Car Accident				Death Notification				Court/Interview				Exercise				Neutral			
Group	Scene	App	Inc	Cons	Scene	App	Inc	Cons	Scene	App	Inc	Cons	Scene	App	Inc	Cons	Scene	App	Inc	Cons
									Clear/Unclear											
Police																				
M	73.30	78.15	83.00	82.00	73.15	80.70	83.45	80.75	78.00	77.80	85.55	84.35	87.80	81.30	78.85	85.30	88.25	87.40	89.85	85.25
SD	26.72	22.45	17.04	18.16	25.74	15.39	13.26	16.16	23.38	22.36	13.74	11.99	13.54	22.80	21.53	14.72	10.23	8.69	7.06	14.31
Control																				
M									76.25	77.05	78.05	79.45	81.10	83.15	84.00	87.15	85.30	83.80	83.70	87.65
SD									18.59	19.01	17.03	17.40	22.11	17.18	20.13	15.58	18.67	19.32	16.59	16.05
									Close/Not Close											
Police																				
M	79.00	74.40	77.80	79.80	74.95	77.25	76.35	77.45	81.20	74.15	79.85	79.15	73.60	76.00	77.55	80.15	84.10	84.45	82.90	81.90
SD	16.70	26.49	26.57	24.40	23.81	21.89	23.11	21.92	16.23	26.11	25.75	23.93	25.10	21.43	24.30	22.29	16.09	14.31	21.31	22.61
Control																				
M									80.40	80.05	82.40	82.20	82.75	83.25	82.90	85.00	86.95	85.20	87.10	88.05
SD									14.35	15.43	13.02	13.58	12.28	14.06	13.97	14.27	11.56	11.42	11.48	14.85

APPENDIX I

POST HOC ANALYSES FOR SCRIPT X STAGE INTERACTIONS COMPARING THE THREE COMMON SCRIPTS FOR BOTH GROUPS.

Table A2. The F values and significance levels for the script by stage interactions of the psychophysiological responses to the three common scripts for both groups (df = 1,228).

Stage	DV	Script Comparison	F Value
Stage 1			
	FBV	Neutral v Exercise	0.01
		Neutral v Court	1.78
		Exercise v Court	2.07
	FPA	Neutral v Exercise	6.65 *
		Neutral v Court	31.70***
		Exercise v Court	9.31 *
	HR	Neutral v Exercise	17.22***
		Neutral v Court	68.24***
		Exercise v Court	16.91***
	EMG	Neutral v Exercise	0.06
		Neutral v Court	0.22
		Exercise v Court	0.48
	RESP	Neutral v Exercise	10.01**
		Neutral v Court	17.75***
		Exercise v Court	1.10
	SCL	Neutral v Exercise	0.60
		Neutral v Court	6.85 *
		Exercise v Court	3.39
Stage 2			
	FBV	Neutral v Exercise	0.65
		Neutral v Court	2.04
		Exercise v Court	0.33
	FPA	Neutral v Exercise	4.63
		Neutral v Court	32.94***
		Exercise v Court	12.86**
	HR	Neutral v Exercise	8.26**
		Neutral v Court	68.97***
		Exercise v Court	29.51***
	EMG	Neutral v Exercise	0.76
		Neutral v Court	12.36**
		Exercise v Court	14.62***
	RESP	Neutral v Exercise	18.01***
		Neutral v Court	330.72***
		Exercise v Court	194.36***

	SCL	Neutral v Exercise	14.87**
		Neutral v Court	26.48***
		Exercise v Court	1.66
Stage 3			
	FBV	Neutral v Exercise	4.74
		Neutral v Court	20.68**
		Exercise v Court	5.61
	FPA	Neutral v Exercise	19.46***
		Neutral v Court	76.93***
		Exercise v Court	19.01***
	HR	Neutral v Exercise	7.17**
		Neutral v Court	71.08***
		Exercise v Court	33.09***
	EMG	Neutral v Exercise	0.98
		Neutral v Court	13.02**
		Exercise v Court	12.88**
	RESP	Neutral v Exercise	23.84***
		Neutral v Court	55.95***
		Exercise v Court	6.75 *
	SCL	Neutral v Exercise	27.40***
		Neutral v Court	45.33***
		Exercise v Court	2.24
Stage 4			
	FBV	Neutral v Exercise	2.64
		Neutral v Court	12.00 *
		Exercise v Court	0.07
	FPA	Neutral v Exercise	0.07
		Neutral v Court	9.67 *
		Exercise v Court	8.07 *
	HR	Neutral v Exercise	5.01 *
		Neutral v Court	80.03***
		Exercise v Court	45.00***
	EMG	Neutral v Exercise	1.91
		Neutral v Court	12.19**
		Exercise v Court	4.45 *
	RESP	Neutral v Exercise	8.18 *
		Neutral v Court	6.63 *
		Exercise v Court	0.08
	SCL	Neutral v Exercise	52.15***
		Neutral v Court	49.76***
		Exercise v Court	0.03

DV	Script	Stage Comparison	F Value
FBV			
	Court	Stage 1 v Stage 2	0.09
		Stage 1 v Stage 3	0.40
		Stage 1 v Stage 4	0.06
		Stage 2 v Stage 3	0.35
		Stage 2 v Stage 4	0.30
		Stage 3 v Stage 4	0.70
	Exercise	Stage 1 v Stage 2	0.03
		Stage 1 v Stage 3	0.09
		Stage 1 v Stage 4	0.02
		Stage 2 v Stage 3	0.64
		Stage 2 v Stage 4	0.75
		Stage 3 v Stage 4	0.02
	Neutral	Stage 1 v Stage 2	0.16
		Stage 1 v Stage 3	6.65 *
		Stage 1 v Stage 4	3.55
		Stage 2 v Stage 3	0.03
		Stage 2 v Stage 4	2.22
		Stage 3 v Stage 4	0.49
FPA			
	Court	Stage 1 v Stage 2	0.34
		Stage 1 v Stage 3	0.12
		Stage 1 v Stage 4	10.19 *
		Stage 2 v Stage 3	0.06
		Stage 2 v Stage 4	6.79 *
		Stage 3 v Stage 4	8.07 *
	Exercise	Stage 1 v Stage 2	1.26
		Stage 1 v Stage 3	2.76
		Stage 1 v Stage 4	8.89 *
		Stage 2 v Stage 3	0.29
		Stage 2 v Stage 4	3.46
		Stage 3 v Stage 4	1.74
	Neutral	Stage 1 v Stage 2	0.48
		Stage 1 v Stage 3	12.20 *
		Stage 1 v Stage 4	0.45
		Stage 2 v Stage 3	7.83 *
		Stage 2 v Stage 4	0.98
		Stage 3 v Stage 4	7.96 *
HR			
	Court	Stage 1 v Stage 2	1.63
		Stage 1 v Stage 3	2.95
		Stage 1 v Stage 4	2.24
		Stage 2 v Stage 3	0.19
		Stage 2 v Stage 4	0.05
		Stage 3 v Stage 4	0.05

	Exercise	Stage 1 v Stage 2	0.00
		Stage 1 v Stage 3	0.01
		Stage 1 v Stage 4	1.21
		Stage 2 v Stage 3	0.01
		Stage 2 v Stage 4	1.12
		Stage 3 v Stage 4	1.38
	Neutral	Stage 1 v Stage 2	1.52
		Stage 1 v Stage 3	2.39
		Stage 1 v Stage 4	0.66
		Stage 2 v Stage 3	0.10
		Stage 2 v Stage 4	0.18
		Stage 3 v Stage 4	0.54
EMG			
	Court	Stage 1 v Stage 2	11.00**
		Stage 1 v Stage 3	15.01***
		Stage 1 v Stage 4	7.94**
		Stage 2 v Stage 3	0.58
		Stage 2 v Stage 4	0.62
		Stage 3 v Stage 4	0.29
	Exercise	Stage 1 v Stage 2	0.04
		Stage 1 v Stage 3	0.99
		Stage 1 v Stage 4	0.16
		Stage 2 v Stage 3	0.43
		Stage 2 v Stage 4	0.23
		Stage 3 v Stage 4	0.67
	Neutral	Stage 1 v Stage 2	0.78
		Stage 1 v Stage 3	0.46
		Stage 1 v Stage 4	0.41
		Stage 2 v Stage 3	0.64
		Stage 2 v Stage 4	0.63
		Stage 3 v Stage 4	0.88
RESP			
	Court	Stage 1 v Stage 2	1.90
		Stage 1 v Stage 3	15.66***
		Stage 1 v Stage 4	0.24
		Stage 2 v Stage 3	6.65 *
		Stage 2 v Stage 4	3.51
		Stage 3 v Stage 4	19.81***
	Exercise	Stage 1 v Stage 2	2.09
		Stage 1 v Stage 3	5.61 *
		Stage 1 v Stage 4	0.77
		Stage 2 v Stage 3	0.85
		Stage 2 v Stage 4	0.32
		Stage 3 v Stage 4	2.22

	Neutral	Stage 1 v Stage 2	0.04
		Stage 1 v Stage 3	0.36
		Stage 1 v Stage 4	1.42
		Stage 2 v Stage 3	0.66
		Stage 2 v Stage 4	1.96
		Stage 3 v Stage 4	0.56
SCL			
	Court	Stage 1 v Stage 2	0.34
		Stage 1 v Stage 3	0.00
		Stage 1 v Stage 4	0.00
		Stage 2 v Stage 3	0.79
		Stage 2 v Stage 4	5.47 *
		Stage 3 v Stage 4	0.00
	Exercise	Stage 1 v Stage 2	0.00
		Stage 1 v Stage 3	0.09
		Stage 1 v Stage 4	0.36
		Stage 2 v Stage 3	0.74
		Stage 2 v Stage 4	0.38
		Stage 3 v Stage 4	1.48
	Neutral	Stage 1 v Stage 2	9.67**
		Stage 1 v Stage 3	17.25***
		Stage 1 v Stage 4	54.10***
		Stage 2 v Stage 3	1.09
		Stage 2 v Stage 4	18.03***
		Stage 3 v Stage 4	10.26**

*p<.05
**p<.01
***p<.001

Table A3. The F values and significance levels for the script by stage interactions of the VAS responses to the three common scripts for both groups (df=1,228).

Stage	VAS	Script Comparison	F Value
Stage 1			
	Relaxed/ Tense	Neutral v Exercise	23.58***
		Neutral v Court	283.44***
		Exercise v Court	143.51***
	Calm/ Angry	Neutral v Exercise	9.35**
		Neutral v Court	183.05***
		Exercise v Court	109.68***
	Unafraid/ Afraid	Neutral v Exercise	10.92**
		Neutral v Court	362.46***
		Exercise v Court	247.56***
	Happy/ Sad	Neutral v Exercise	2.81
		Neutral v Court	127.11***
		Exercise v Court	130.35***
	Normal/ Numb	Neutral v Exercise	1.90
		Neutral v Court	138.81***
		Exercise v Court	108.20***
	Normal/ Unreal	Neutral v Exercise	0.25
		Neutral v Court	150.23***
		Exercise v Court	123.33***
Stage 2			
	Relaxed/ Tense	Neutral v Exercise	18.01***
		Neutral v Court	330.72***
		Exercise v Court	194.36***
	Calm/ Angry	Neutral v Exercise	10.19**
		Neutral v Court	201.21***
		Exercise v Court	120.85***
	Unafraid/ Afraid	Neutral v Exercise	10.98**
		Neutral v Court	368.93***
		Exercise v Court	252.60***
	Happy/ Sad	Neutral v Exercise	0.05
		Neutral v Court	163.54***
		Exercise v Court	157.99***
	Normal/ Numb	Neutral v Exercise	1.88
		Neutral v Court	161.08***
		Exercise v Court	128.18***

	Normal/ Unreal	Neutral v Exercise	2.98
		Neutral v Court	183.03***
		Exercise v Court	139.28***
Stage 3			
	Relaxed/ Tense	Neutral v Exercise	112.76***
		Neutral v Court	389.86***
		Exercise v Court	83.36***
	Calm/ Angry	Neutral v Exercise	69.69***
		Neutral v Court	337.97***
		Exercise v Court	100.72***
	Unafraid/ Afraid	Neutral v Exercise	6.38 *
		Neutral v Court	413.85***
		Exercise v Court	317.48***
	Happy/ Sad	Neutral v Exercise	7.78**
		Neutral v Court	202.66***
		Exercise v Court	131.01***
	Normal/ Numb	Neutral v Exercise	26.29***
		Neutral v Court	225.32***
		Exercise v Court	97.68***
	Normal/ Unreal	Neutral v Exercise	25.14***
		Neutral v Court	215.51***
		Exercise v Court	93.44***
Stage 4			
	Relaxed/ Tense	Neutral v Exercise	33.42***
		Neutral v Court	66.11***
		Exercise v Court	5.52 *
	Calm/ Angry	Neutral v Exercise	13.67***
		Neutral v Court	146.86***
		Exercise v Court	70.96***
	Unafraid/ Afraid	Neutral v Exercise	2.01
		Neutral v Court	91.51***
		Exercise v Court	66.40***
	Happy/ Sad	Neutral v Exercise	0.36
		Neutral v Court	60.38***
		Exercise v Court	75.42***
	Normal/ Numb	Neutral v Exercise	16.33***
		Neutral v Court	146.52***
		Exercise v Court	65.02***
	Normal/ Unreal	Neutral v Exercise	13.25***
		Neutral v Court	151.37***
		Exercise v Court	75.05***

DV	Script	Stage Comparison	F Value
Relaxed/Tense			
	Court	Stage 1 v Stage 2	0.42
		Stage 1 v Stage 3	3.28
		Stage 1 v Stage 4	80.37***
		Stage 2 v Stage 3	1.35
		Stage 2 v Stage 4	92.45***
		Stage 3 v Stage 4	116.12***
	Exercise	Stage 1 v Stage 2	0.00
		Stage 1 v Stage 3	29.84***
		Stage 1 v Stage 4	0.08
		Stage 2 v Stage 3	29.73***
		Stage 2 v Stage 4	0.08
		Stage 3 v Stage 4	26.76***
	Neutral	Stage 1 v Stage 2	0.06
		Stage 1 v Stage 3	0.16
		Stage 1 v Stage 4	0.01
		Stage 2 v Stage 3	0.03
		Stage 2 v Stage 4	0.12
		Stage 3 v Stage 4	0.26
Calm/Angry			
	Court	Stage 1 v Stage 2	0.81
		Stage 1 v Stage 3	31.38***
		Stage 1 v Stage 4	2.55
		Stage 2 v Stage 3	22.12***
		Stage 2 v Stage 4	6.22 *
		Stage 3 v Stage 4	51.80***
	Exercise	Stage 1 v Stage 2	0.14
		Stage 1 v Stage 3	36.46***
		Stage 1 v Stage 4	0.21
		Stage 2 v Stage 3	32.04***
		Stage 2 v Stage 4	0.01
		Stage 3 v Stage 4	31.19***
	Neutral	Stage 1 v Stage 2	0.06
		Stage 1 v Stage 3	0.56
		Stage 1 v Stage 4	0.03
		Stage 2 v Stage 3	0.25
		Stage 2 v Stage 4	0.18
		Stage 3 v Stage 4	0.87
Unafraid/Afraid			
	Court	Stage 1 v Stage 2	0.94
		Stage 1 v Stage 3	6.81 *
		Stage 1 v Stage 4	88.31***
		Stage 2 v Stage 3	2.70
		Stage 2 v Stage 4	107.42***
		Stage 3 v Stage 4	144.17***

	Exercise	Stage 1 v Stage 2	0.65
		Stage 1 v Stage 3	0.28
		Stage 1 v Stage 4	3.28
		Stage 2 v Stage 3	0.08
		Stage 2 v Stage 4	6.86 *
		Stage 3 v Stage 4	5.46 *
	Neutral	Stage 1 v Stage 2	0.64
		Stage 1 v Stage 3	1.70
		Stage 1 v Stage 4	0.01
		Stage 2 v Stage 3	0.26
		Stage 2 v Stage 4	0.52
		Stage 3 v Stage 4	1.51
Happy/Sad			
	Court	Stage 1 v Stage 2	2.65
		Stage 1 v Stage 3	6.22 *
		Stage 1 v Stage 4	31.35***
		Stage 2 v Stage 3	0.75
		Stage 2 v Stage 4	52.24***
		Stage 3 v Stage 4	65.51***
	Exercise	Stage 1 v Stage 2	0.23
		Stage 1 v Stage 3	6.08 *
		Stage 1 v Stage 4	8.22**
		Stage 2 v Stage 3	3.96
		Stage 2 v Stage 4	11.17**
		Stage 3 v Stage 4	28.44***
	Neutral	Stage 1 v Stage 2	0.01
		Stage 1 v Stage 3	0.22
		Stage 1 v Stage 4	4.39 *
		Stage 2 v Stage 3	0.34
		Stage 2 v Stage 4	4.88 *
		Stage 3 v Stage 4	2.65
Normal/Numb			
	Court	Stage 1 v Stage 2	2.04
		Stage 1 v Stage 3	12.27**
		Stage 1 v Stage 4	0.09
		Stage 2 v Stage 3	4.30 *
		Stage 2 v Stage 4	3.00
		Stage 3 v Stage 4	14.49***
	Exercise	Stage 1 v Stage 2	0.26
		Stage 1 v Stage 3	16.18***
		Stage 1 v Stage 4	4.14
		Stage 2 v Stage 3	12.34**
		Stage 2 v Stage 4	2.33
		Stage 3 v Stage 4	3.95

	Neutral	Stage 1 v Stage 2	0.27
		Stage 1 v Stage 3	0.08
		Stage 1 v Stage 4	0.39
		Stage 2 v Stage 3	0.06
		Stage 2 v Stage 4	1.31
		Stage 3 v Stage 4	0.81
Normal/Unreal			
	Court	Stage 1 v Stage 2	1.74
		Stage 1 v Stage 3	8.72**
		Stage 1 v Stage 4	0.00
		Stage 2 v Stage 3	2.67
		Stage 2 v Stage 4	1.76
		Stage 3 v Stage 4	0.00
	Exercise	Stage 1 v Stage 2	0.39
		Stage 1 v Stage 3	19.29***
		Stage 1 v Stage 4	5.92 *
		Stage 2 v Stage 3	14.21**
		Stage 2 v Stage 4	0.07
		Stage 3 v Stage 4	3.84
	Neutral	Stage 1 v Stage 2	0.00
		Stage 1 v Stage 3	0.28
		Stage 1 v Stage 4	0.00
		Stage 2 v Stage 3	0.23
		Stage 2 v Stage 4	0.01
		Stage 3 v Stage 4	0.34

*p<.05
**p<.01
***p<.001